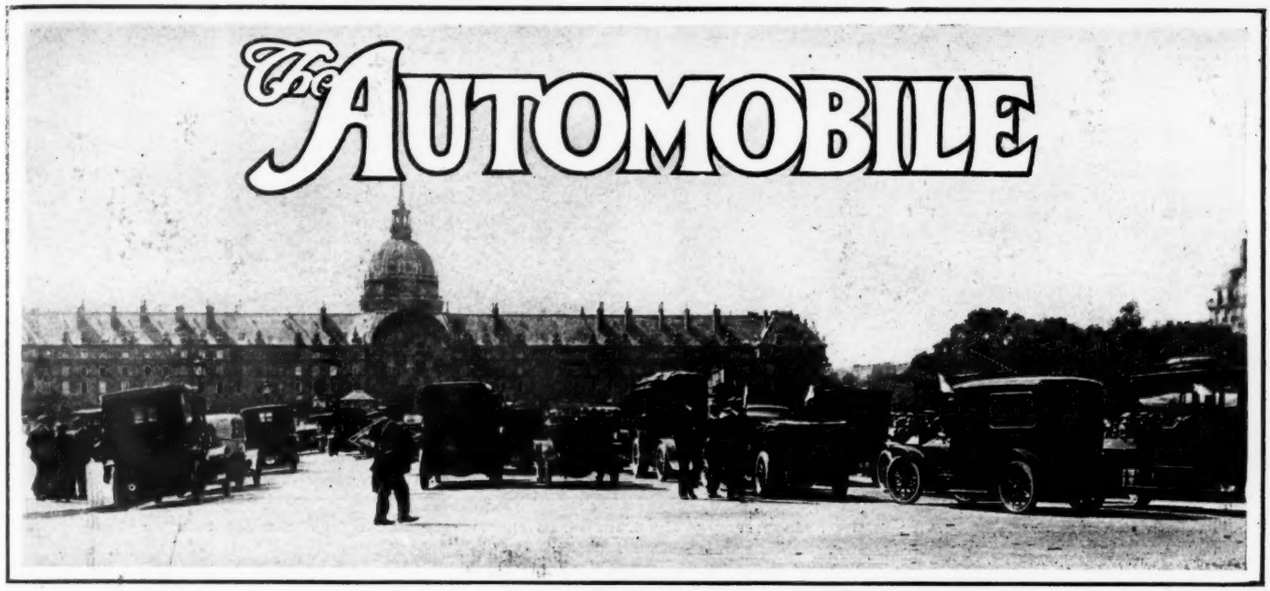
VOL. XXXI NEW YORK—THURSDAY, SEPTEMBER 3, 1914—CHICAGO No. 10



Automobiles gathered on the Esplanade des Invalides in Paris to be requisitioned for service with the troops

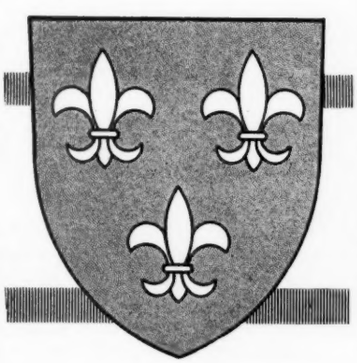
The Call of Mars

100,000 Cars and Trucks Precipitated into Military Service by European Mobilization Orders

By W. F. Bradley

(*Special to THE AUTOMOBILE from Paris*)

PARIS, Aug. 11—At 4.30 o'clock on the afternoon of August 2 a small, unimportant-looking poster was pasted on the walls of every public building in France announcing a general mobilization. Instantly the life of the nation was transformed. In the great automobile district around Paris machinery was stopped, workmen laid down the tools they were using and within 5 minutes were on their way to the railroad depot. This call to arms automatically shut down the automobile factories. The Delage factory, which normally employs 1,000 men, had but forty left when the army had been satisfied; these forty comprised the least useful units. All the heads of departments, being young men, had gone on the first day. The Darracq factory, which is run under English management, was left with its managers but with no workmen; every able-bodied man under 48 years of age joined the troops.



Exportation of Cars Forbidden

Within an hour of the issuing of the mobilization order another decree went forth forbidding the export of automobiles and parts. Thus, if the factories had been able to work they would not have been able to get rid of their produce. All automobiles on the railroad in course of shipment abroad were put onto sidings and will remain there until the war is over. Most of the cars for England are sent unpacked, while chassis are always exported with no other protection than a layer of grease. These machines are all laid up in railroad depots or on the docks, without any protection whatever and will suffer considerable damage.

There were few exceptions to the closing of the factories. When work could be done for the army the military authorities took over the establishment, or such portion of it as they required, placed the staff under military law and required them to work for the government. All factories producing aeroplane motors came under this heading. The Gnome aeroplane motor works was the first to be militarized; the aeroplane motor section of the Renault works were treated in the same way; Le Rhone, Anzani, Canton-Unne and Clement-Bayard works were militarized. The portion of the De Dion-Bouton factory building trucks and army searchlights continued at work for the army only. The same applied to the Panhard-Levassor factory, to the

Steam tractors commandeered for service in the French army. The transformation of these trucks from a peace to a war footing was marvelously rapid

Schneider works at Creusot, where, in addition to heavy artillery, the Paris motorbuses are produced, and to the Latil factory.

From Peace to War Footing in 10 Minutes

Within 10 minutes of the issuing of the mobilization order, subsidized motor trucks belonging to the big dry goods stores in Paris were being driven away by military reservists. Within an hour of the order going forth there was not a motorbus on the streets of Paris. The Paris General Omnibus Co., which holds a monopoly of this service, has 1,000 buses, of which 900 are constantly in service. As soon as the order was up the drivers continued the journey they were making and then ran for the central depot. Here the buses were transformed by taking out the seats and windows and fitting fine wire gauze screens. The rails for straphangers received meat hooks, and with this transformation, which occupied but a few hours, the vehicles were ready to move to the front. This work was admirably carried out; in most cases the drivers were eligible for military service and remained with their vehicles. The buses were divided into groups of about a dozen, and as all the units in the group are of one type spare parts could be reduced to a minimum. Absolute secrecy is observed regarding military movements, the journalists who publish information likely to be of use to the enemy being liable to court martial, yet it is possible to state that the transformation of the motor buses into meat wagons was carried out with remarkable celerity and that many of these vehicles are at the present time serving with the French troops. They made the journey from Paris to Belgium by road. With the taking over of the Paris omnibuses went the company's reserve supply of fuel and also all their sources of supply. To meet any emergencies a reserve of several hundred thousands of gallons of benzol is maintained in the underground tanks of the company's depots at Paris.

Over 100,000 Cars and Trucks in War

Most careful estimates point to the use of more than 70,000 motor vehicles of all kinds with the French army now advancing into German territory. Fifty thousand touring cars have been called up for service, these being made use of by officers in the various branches of the service, for reconnoitering, for despatch work, for rapid raids into the enemy's country, for flying brigades, and for the Red Cross service. Only a very small number of these cars were originally owned by the army; the immense majority have either been requisitioned or have been brought up by motor reservists, who remain as their drivers, according to a prearranged plan. When the cars are requisitioned their owners are given

Traveling work shop connected with the aeroplane corps. This is a gasoline truck with a van body containing a dynamo, lathe, drills, band saws, a forge, etc., for repairing aeroplanes

treasury notes payable after the war, the price being fixed by the authorities. Cars with elegant bodies are generally given over at a loss; officers have no need for fine paint work and elegant finish. Good automobiles with cheap bodies are generally paid a very satisfactory price.

There is still a big demand for trucks. The army has secured 18,000, these comprising all the subsidized models, and many which have been purchased outright since the declaration of war; it has 1,100 motor buses supplied by the Paris General Omnibus Co.; 200 four-wheel-drive tractors, about fifty motor searchlights, and probably 100 various special vehicles, such as water wagons, traveling kitchens, captive balloon cars, etc.

The German army probably has the use of 35,000 automobiles of various types. Belgium, which does not keep up a very big service, has put into use from 6,000 to 8,000 private automobiles and trucks. This gives a total for the three Continental powers of France, Belgium and Germany of more than 100,000 automobiles in war service.

Service Test for Four-Wheel-Drive

Four-wheel-drive tractors, which have been carefully developed during the last 2 years, will come into active service for the first time. The majority of these vehicles have been built by Panhard, other makers being Latil, Renault, and Schneider. These tractors are hauling the 155-millimeter

guns, together with their necessary ammunition, and are also being employed for hauling provisions on trailers. If the maneuvers can be taken as any indication of their value, they will render good service in this war. They can travel over any kind of country, for they have been tested over the most difficult land on the German frontier, while their capacity is much greater and their speed much higher than that of any horse vehicles.

Large numbers of automobiles are being used in conjunction with the flying brigade. These machines are a varied class, from light trucks carrying partially dismounted aeroplanes to what are practically ordinary touring cars fitted up to give first aid to disabled flying machines. Aeroplanes work in "escadrilles," each one consisting of seven or eight machines, and having a determined number of attached automobiles. In the important centers a traveling workshop is employed. This is a gasoline automobile with a van body containing a dynamo, a lathe, drills, band saws, a forge, etc., of such a complete nature that practically any repair can be carried out.

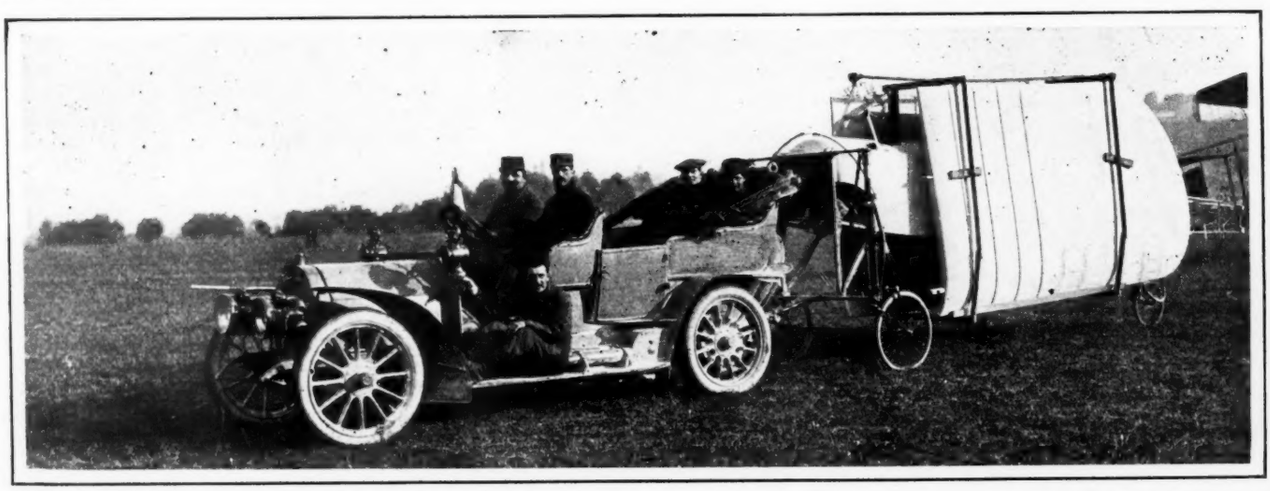
Racing Drivers at Their Posts

All the staff officers make use of private touring cars, the preferred type of machine being a five-passenger fast, open car. Practically all these machines have been taken from private service, the men who are driving them being reservists. In this category are numbers of the leading French race drivers. Georges Boillot was called up just before the declaration of war and with a fast Peugeot was given the task of driving General Joffre, chief of the French army. Victor Rigal, with a similar type of car, was attached to another general. Jules Goux's indicated post was in a fort at Belfort, practically within a stone's throw of German territory. He took up this position immediately he was called, although he might have been incorporated in the aeroplane corps if he had made application. Albert Guyot joined his corps at Orleans, where it is understood that he was given the task of driving an officer. His regiment was immediately ordered to the front and no news is available concerning it. Réne Thomas is in the aeroplane corps and Arthur Duray is said to be with the Belgian army.

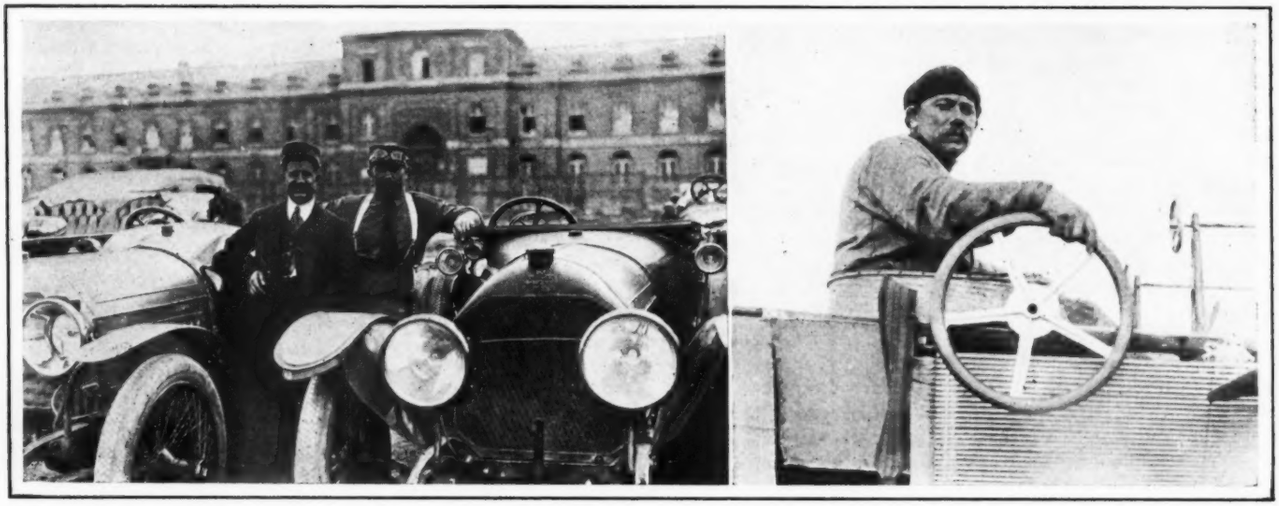
Portable wireless telegraph station used by the French army. This is a motor truck with a special body containing complete wireless outfit

Touring Is Impossible

Automobile touring in France, and indeed throughout the whole of Continental Europe, is an utter impossibility. France has been declared in a state of siege, thus putting the whole of the authority in the hands of the military. It is impossible for any person to use an automobile in Paris unless provided with a permit from the police. To travel outside Paris a special permit must be secured from the War Department. This bears the photograph of the holder and must be shown at every request of the authorities. I have just traveled from Dieppe to Paris, a distance of about 130 miles. On starting out the Dieppe authorities provided me with a pass which had to be presented to the chief of police in every town where I stayed more than 6 hours, and had to be given up for examination when requested. The first request came about 7 miles out of Dieppe. A couple of soldiers carrying rifles with fixed bayonets barred the road and asked for my papers. After they had been carefully examined I was allowed to continue. At the entrance and exit to every village, at the passage over or under every railway, at every bridge over a river, the same close scrutiny took place. At 7.30 o'clock every person had to be off the road, the guards having orders to fire on every person traveling after that hour. My own pass gave me the right to travel to Paris only; before another journey can be made a fresh pass must be secured indicating the route to be followed. This system makes it possible to keep a close control of all cars. As soon as war was declared French subjects who were eligible for military service but were not in the automobile corps had to bring their automobiles for inspection. Many of these machines were commandeered. Others, having no military obligations, had to obtain a special military pass before they could use their cars, and by reason of this application they were brought in contact with the authorities who thus obtained



One of the methods of transporting the aeroplanes over the country by the French army. The aeroplane is compactly folded together and towed by a touring car



Left—Victor Rigal and Georges Boillot as soldiers in the French army. Boillot is driving General Joffre. Rigal is driving an officer of the headquarters staff. Right—René Thomas, winner of the Indianapolis race, who has volunteered for aeroplane service with the French army

the assurance that the cars were in running order, and only consented to issue the pass if assurance was given that the cars could be obtained for army purposes when required.

Escape of American Tourists

American automobilists touring in France were badly hit on the outbreak of the war. Germans and Austrians were given 24 hours to get out of the country or be made prisoners; other foreigners had to leave the country within the same period or comply with stringent police regulations. On the expiration of this period foreigners could only leave the country with a special permit. The only means of escape for American automobilists was by the Channel ports to England. Many a party raced across France with the hope of reaching Dieppe, Havre, Boulogne, or Calais before the expiration of the first day of mobilization. After driving in many cases for 18 to 20 hours without a stop and without a break for food, it was found that the car could not be taken abroad, for at the time the expulsion notice was given an order went into force immediately forbidding the exportation of automobiles. Even if this law had not been in force, the cross-Channel boats were so crowded that it was an utter impossibility to get cars abroad. The outbreak of hostilities coincided with the English Bank Holiday period, when thousands of Britishers invaded the French coast with no thought of war. These people had to get out of the country by midnight of August 2, when all ordinary boat service with England was cut off. Boats which normally carried a thousand passengers took on three times that number; women dropped on the decks and lay where they had dropped.

Abandon Cars on Streets

Motorists, unwilling to believe that the laws were drastic, moved along the coast from Havre to Dieppe, from Dieppe to Boulogne, and from Boulogne to Calais, only to find themselves at midnight on a pier with crowds of casual visitors fighting for a place on a boat and willing to abandon all their baggage if they could get out of the country. In the town of Dieppe alone sixty English and American cars were left behind; along this coast it is estimated that 300 foreign cars were abandoned. Most of the owners had the forethought to place their cars in a reliable garage, from which they could withdraw them after the war, if not requisitioned in the meantime. Others waited until the last minute, then abandoned their cars in the public square. A few, thinking only of their own safety, told the chauffeur to do the best he could, and as soon as the owners had made for the boat, carrying their own baggage, the chauffeur left the car in the street and fought his way abroad. At Dieppe I saw two Packard cars abandoned on the quay side; a French car owned by Americans had also been left behind, the chauffeur not even taking the trouble to stop the motor. I saw this car at 7 o'clock in the evening; when the last boat went out soon after midnight the motor was still running. When the foreigners had departed the French authorities collected these abandoned cars; some have gone into active service with the troops; others can be claimed after the war.

French families were as hard hit as the foreigners. Thousands of motorists were staying on the Normandy and Brittany coasts, 120 to 200 miles from Paris. With the mobilization order the entire railroad service went into the hands of the military; passengers were carried if there was room for them, but no heavy baggage would be handled. As one, two, and sometimes three members of a family had to leave for the front within 24 hours, it was necessary to get back to Paris without a moment's delay. In very many cases open touring cars were decked over, piled up with trunks to a height of 6 feet, and the chauffeur told to make for Paris as quickly as possible. The family followed in a second car, if they possessed one, or trusted to the train service.

Officers Only Motorists in Paris

In other cases a contrary movement took place. Timid persons imagined that safety lay in getting as far away from Paris as possible, and cars were loaded far beyond their capacity to take passengers and their belongings to some distant corner of Brittany. The automobile traffic on the roads during the first day of mobilization was intense. Now that all the troops have been moved toward the east the roads west of Paris are deserted. It is possible to travel a whole day and not meet a dozen cars. Eastward, on the other hand, the movement is intense, but is entirely of a military nature.

Paris traffic is confined to automobiles carrying officers. There is not a single motorbus in the city; three-quarters of the taxicabs have been withdrawn owing to the departure of their drivers for the front. Within the city limits traffic regulations are normal, but no automobile is allowed to go out of the city without a military pass and no car can be on the roads outside Paris later than 7.30 p. m. With very rare exceptions the automobile stores in Paris are closed. The German firms, Continental, Mercedes, Benz, Opel, etc., have taken the precaution to remove all their signs in order to prevent the wreckage of their buildings. There were a few popular outbreaks against Germans on the declaration of war, although no automobile firms were attacked. Since then the authorities have taken all necessary precautions to prevent rioting, for these patriotic outbursts gave an opportunity to the criminal class to work for their own ends. A

civil guard has been instituted and big sight-seeing automobiles are maintained at the police headquarters to carry police to the scene of any disturbance which may be reported with the least possible delay.

Many American Cars Held Up

There are numerous American cars held up in France, but they have not been seized. It is possible for their owners to use them, under certain restrictions, but it is not possible for them to take the machines out of the country. There are a few cases of Americans having had their cars taken from them through transgression of the military laws. One of these is James Gordon Bennett, who traveled to Chalons sur Marne, the center of one of the greatest French camps, and was ordered to forfeit his car. The interdiction against touring in certain zones was not put into force without warning, and it is doubtful if there is a single case of a genuine touring party having been detained while seeking to get home.

While the general result has been an abrupt cessation of business, the Packard company appears to be exceptional in having found the war profitable. The Paris branch has not been closed, and, it is declared, will not be shut down so long as it is possible to do any business. With the sudden outbreak of hostilities hundreds of Americans sought to hire cars to travel to the ports. Many had passages booked on steamers but without a car could not get to the shore. Touring parties were willing to pay any fancy price in order to get a car to take them to one of the Channel ports. The entire fleet of Packard touring cars was pressed into service and for several days an uninterrupted service was maintained between Paris and the sea. Among those who got to the sea by the Packard service was the sister of President Wilson.

American Cars May Gain Business

Miss Goode, who is temporarily in charge in the absence of General Manager R. N. Goode in America, states that so far as their branch is concerned the ultimate result of the war may be satisfactory. French people who have had their cars requisitioned are already making inquiries for Packards.

No Molestation of German Car Industries

The Mercedes stores spare-parts department and repair shops at Puteaux, near Paris, have been requisitioned by the army authorities. These buildings are next door to the French artillery factory and have been made use of as an extension to the gun-making works. All the cars which were found in the building have been taken over by the French

Département de la Seine-Inférieure
VILLE DE DIEPPE
LAISSEZ-PASSER

Special army pass given to automobilists, without which it is impossible to travel in a motor car of any description on French roads

Panhard tractor hauling 155 millimeter siege guns and ammunition wagons

troops. A portion of this building is also used as barracks for the Paris firemen, now doing service in the suburbs. The Mercedes showrooms in the Champs Elysees have been closed in the usual way, and remain untouched. About a dozen handsome cars ready for delivery are in this store, and are visible from the street, but they have not been taken nor has any damage been done to the building by the populace. Every other automobile store in Paris has been cleared of its stock, and in not a single case is any attempt being made to do business. Much of the French stock has been taken over by the army.

In place of cars manufacturers display flags in their windows and a notice is posted to the effect that inquiries should be addressed to the factory. In the whole of the Avenue de la Grande Armée and Champs Elysees district the only store open all day is a big accessory department; a few tire and accessory dealers open for a few hours. Some firms have even taken the precaution of nailing heavy boards across the windows of their showrooms, although the city is so quiet that such a measure is entirely superfluous.

The Continental Tire Co. shut down both its factory and its general offices as soon as mobilization was declared. The precaution was taken to remove the name of the firm from all the buildings, for during the past few years rival firms have conducted a jingo campaign against this firm, maintaining that it was established for the purpose of securing French military secrets. The campaign was never looked upon as more than a doubtful business move, but with the war fever running high precautions had to be taken.

On Belgian Battlefields

I have just been able to make a journey into Belgium, where there is rather more liberty, and to travel a considerable distance by automobile and on foot. Every road is guarded, it being impossible to advance more than 5 or 6 miles without the order being given for papers to be presented. To the east and northeast of Brussels on all the roads leading to the German lines special precautions have been taken against the passage of spies and to prevent the inroads of Germans using automobiles. Heavy farm wagons are placed across the road, one wagon blocking half the road and a second wagon a few yards away obstructing the other half. It is possible to pass between the two wagons, but only at a walking pace. When attacks are feared the space under the wagons is filled up with granite blocks commonly used for paving roads. This makes a strong barricade and at the same time provides interstices for firing.

(*Continued on page* 463)

Standardize Used-Car Prices

Used-Car Central Market Reports of Chicago Automobile Trade Assn. Show Dealers Actual Prices Paid for Cars Without Revealing Business Secrets

Based on Chicago Prices at Present but System Will Be Extended to Other Centers

CHICAGO, ILL., Sept. 1—A "Used-Car Central Market Report," which tells you how much you should allow when taking a used car of any make or any vintage in trade on a new machine, is not a creation of the imagination but an actual fact.

This "Used-Car Central Market Report" has been an actuality for a little over 2 weeks.

The idea of a "Used-Car Central Market Report" was conceived in Chicago by H. M. Allison, President of the Chicago Automobile Trade Assn., on his election to that position last February. The idea was made a reality within the past 6 months by President Allison and his energetic board of directors.

The "Used-Car Central Market Report" is a forty-page book with pages 10 by 7 inches. The book is filled from cover to cover with valuations of used cars. If you are a dealer and a prospect wants to trade in a 1909 Chalmers Model F, 24-horsepower runabout, you can look up your Central Market Report and see that the average allowance for this car in trades has been $325, and further that its value has been appraised by other dealers at $220. So with twenty other Chalmers models any one of which you might have to take in trade; and so with an even hundred other makes of gasoline cars and besides these are fourteen different makes of electrics. You have the value of them all as used cars.

Fig. 1 is a specimen page taken from the first issue of the "Used-Car Central Market Report." It shows the valuation placed on used Packard and other cars. The first column gives the model, the second the year of its manufacture, the third its body type, whether roadster, touring or runabout; this is followed by passenger capacity, number of cylinders, horsepower calculated by A. L. A. M. formulæ and then comes the list price of the car when new.

Actual Prices Paid Are Given

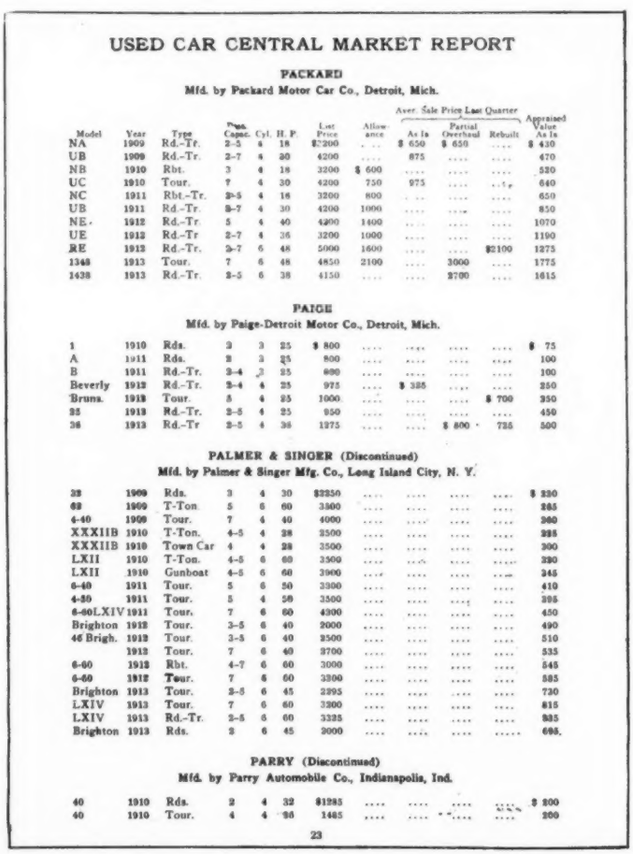
Next you come to the real information, the column headed "Allowance," which means what the dealer selling Packard cars is supposed to allow for the different models. Do not pay too much attention to this column, but pass on to the column marked "As is." This column tells the real story, contains the information you want. "As is" means what these models have actually been sold for, after being taken in in trades. This figure does not mean what one car has sold for but it is the average of perhaps what a dozen used cars of this model have sold for.

After the "As is" column is another headed "Partial overhaul," in which are given the figures these cars have actually sold for after being taken in trade and then partially overhauled.

Then follows another column headed "Rebuilt," which indicates what these used cars have actually brought after the dealer has rebuilt them. These figures are, of course, much higher than those in the two preceding columns, in that the rebuilt used car should bring much more than the partially rebuilt one, or the car that is sold just as it is taken in in the trade deal.

We now come to the last column in Fig. 1 headed "Appraised value." By "Appraised value" is meant a value placed on the car by all of the dealers in Chicago selling other makes of cars listing in the same zone as the Packard. Thus this appraised value would be arrived at by such dealers as Pierce, Locomobile, Peerless, White, Winton and some others. Generally this appraised value comes very close to the actual prices that used cars have brought, it being quite common for the appraised value not to be more than $50 or $75 under the actual selling value of these cars.

Here is another instance from the first issue of the Used-Car Central Market Report of the Chicago Automobile Trade Assn. At the top of the page appears a portion of the Chalmers line, the earlier models being on a preceding page. The prices for Model 10, 1912, show how close the "As is" selling value is to the "Appraised Value." This model was actually sold for $680, and the group of Chicago dealers sell-



USED CAR CENTRAL MARKET REPORT

PACKARD

Mfd. by Packard Motor Car Co., Detroit, Mich.

Model	Year	Type	Pass. Capac.	Cyl.	H. P.	List Price	Allowance	Aver. Sale Price Last Quarter: As Is	Partial Overhaul	Rebuilt	Appraised Value As Is
NA	1909	Rd.-Tr.	2-5	4	18	$2200	....	$ 650	$ 650	....	$ 410
UB	1909	Rd.-Tr.	2-7	4	30	4200	....	875	....	....	470
NB	1910	Rbt.	3	4	18	3200	$ 600	....	....	....	520
UC	1910	Tour.	7	4	30	4200	750	975	....	....	640
NC	1911	Rbt.-Tr.	2-5	4	18	3200	800	....	....	....	650
UB	1911	Rd.-Tr.	2-7	4	30	4200	1000	....	....	....	850
NE	1912	Rd.-Tr.	5	4	40	4200	1400	....	....	....	1070
UE	1912	Rd.-Tr	2-7	4	36	3200	1000	....	....	....	1190
RE	1912	Rd.-Tr.	2-7	6	48	5000	1600	....	....	$2100	1275
1348	1913	Tour.	7	6	48	4850	2100	....	3000	....	1775
1438	1913	Rd.-Tr.	2-5	6	38	4150	....	....	3700	....	1615

PAIGE

Mfd. by Paige-Detroit Motor Co., Detroit, Mich.

1	1910	Rds.	2	3	25	$ 800	....	....	....	....	$ 75
A	1911	Rds.	2	3	25	800	....	....	....	....	100
B	1911	Rd.-Tr.	3-4	3	25	800	....	....	....	....	100
Beverly	1912	Rd.-Tr.	2-4	4	25	975	....	$ 385	....	....	250
Bruns.	1913	Tour.	5	4	25	1000	....	....	....	$ 700	350
25	1913	Rd.-Tr.	2-5	4	25	950	....	....	....	....	450
36	1913	Rd.-Tr	2-5	4	36	1275	....	....	$ 800	735	500

PALMER & SINGER (Discontinued)

Mfd. by Palmer & Singer Mfg. Co., Long Island City, N. Y.

22	1909	Rds.	3	4	30	$2350	....	....	....	....	$ 220
62	1909	T-Ton	5	6	60	3300	....	....	....	....	285
4-40	1909	Tour.	7	4	40	4000	....	....	....	....	360
XXXIIB	1910	T-Ton.	4-5	4	28	2500	....	....	....	....	295
XXXIIB	1910	Town Car	4	4	28	2500	....	....	....	....	300
LXII	1910	T-Ton.	4-5	6	60	3500	....	....	....	....	330
LXII	1910	Gunboat	4-5	6	60	3900	....	....	....	....	345
6-40	1911	Tour.	5	6	50	3300	....	....	....	....	410
4-50	1911	Tour.	5	4	50	3500	....	....	....	....	395
6-60LXIV	1911	Tour.	7	6	60	4300	....	....	....	....	450
Brighton	1912	Tour.	3-5	6	40	2000	....	....	....	....	490
46 Brigh.	1912	Tour.	3-5	6	40	3500	....	....	....	....	510
	1912	Tour.	7	6	40	3700	....	....	....	....	535
6-60	1912	Rbt.	4-7	6	60	3000	....	....	....	....	545
6-60	1912	Tour.	7	6	60	3300	....	....	....	....	585
Brighton	1913	Tour.	2-5	6	45	2295	....	....	....	....	730
LXIV	1913	Tour.	7	6	60	3300	....	....	....	....	815
LXIV	1913	Rd.-Tr.	2-5	6	60	3325	....	....	....	....	835
Brighton	1913	Rds.	3	6	45	3000	....	....	....	....	690

PARRY (Discontinued)

Mfd. by Parry Automobile Co., Indianapolis, Ind.

40	1910	Rds.	2	4	32	$1295	....	....	....	....	$ 200
40	1910	Tour.	4	4	32	1485	....	....	....	....	200

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Fig. 1—Page taken from the first issue of the Used-Car Central Market Report of the Chicago Automobile Trade Assn. This page shows the valuation of several makes of used cars. Figures record actual purchase and sales prices without betraying any business secrets of the dealers

ing other cars in this class had appraised this model at $700, but $20 higher than it had actually brought during the first 3 months of this year.

Down further in this Chalmers group is a Model 17, 1913 roadster with an allowance by the Chalmers dealer of $900, an actual sale or "As is" value of $850 and an appraised value by rival dealers of $800. These three figures give proof positive of the value of this Used-Car Central Market Report, to the dealer, no matter where he resides. The report is a real guide, not a bit of guess work or approximation.

These values are all based on the first 3 months of this year, and the figures were obtained from Chicago dealers who actually took the different cars in trades and sold them at the figures given, or at other figures that were used in getting the averages of this market report.

Fig. 2 shows the blank form that each member of the Chicago Automobile Trade Assn. is provided with. This slip was actually made out by some dealer; it may have been the Pierce-Arrow dealer, or it may have been Packard, Locomobile, or any other dealer that took this Model 36, 1911 Pierce-Arrow in trade on a new car. After taking it in the Pierce-Arrow was actually sold for $1,150. The dealer who made this sale furnished the information to the dealers' association, but he did not have to sign his name to the blank form, in fact, there is not an indication on the form as to whom it was received from.

The form is mailed to the dealers' association in a double envelop. It is first placed in a plain white envelop and sealed. This envelop, without address or any distinguishing mark, is placed in an envelop furnished by the dealers' association, and on this outer envelop is a number which the trade association has assigned to the dealer. Each dealer has a different number, and one dealer does not know the number of the other. The confidential secretary of the association is the only one who knows the numbers of the various dealers and the only reason that the envelopes are numbered is that he will know what dealers have been assisting in furnishing the information.

These information blanks or sales slips are the real secret of the system. Before this scheme was evolved it was impossible for the dealers to get together. One mistrusted the other. One refused to tell the other what he allowed on a certain used car and what he actually sold it for. But with the secret sales slip scheme many dealers were at once sold to the proposition. They saw that, although giving out the information, they were yet keeping their business secrets, and not throwing open their books to any rival dealer.

The first volume of the Used-Car Central Market Report came from the printer August 5. It contains the information from 753 slips such as is illustrated in Fig. 2. The information was obtained from many Chicago dealers. Each member of the Chicago Automobile Trade Assn. has received a copy of this first report, which is based on actual values in January, February and March of this year. All of the 753 information slips were based on actual sales of used cars in these 3 months.

Not Restricted to Members of the Association

This first volume is not being restricted to members of the Chicago dealers' association, but already books have been sold to dealers in New York, Philadelphia, Boston, Rochester, Buffalo, Detroit, Columbus, New Orleans, St. Louis, Minneapolis, St. Paul, Denver and San Francisco. The Chicago organization is selling a year's service of these market reports for "xx $24." For this amount you get four volumes of the report, one every 3 months. The next volume will go to press on September 5. It will be larger than the first one, and its information will be based solely on sales made during April, May and June. Already over 630 sales slips have been received and it is yet 2 weeks before the date of closing.

When the dealer buys this market service he does not buy the books or reports but is only loaned them. He keeps volume one until volume two is published and reaches him, at which time he returns volume one. So on with succeeding volumes, a plan similar to the distribution of telephone directories.

DEALERS USED CAR SALES STATEMENT

QUARTER ENDING June 30th 1914 191__

MAKE PIERCE-ARROW

MODEL	YEAR	TYPE	PASS. CAPACITY	CYL.	H.P	LIST PRICE	ACTUAL SALE PRICE AS IS	ACTUAL SALE PRICE PARTIAL OVERHAUL	ACTUAL SALE PRICE REBUILT
36	1911	T. C.	7	6	36	$4000	$1150		

USE SEPARATE BLANK FOR EACH VEHICLE

FILL IN ONLY ONE CAR ON EACH CARD

Fig. 2—Blank form with which each member of the Chicago Automobile Trade Assn. is provided. These slips are made out by dealers and record actual business transactions

In compiling this Used-Car Central Market Report the Chicago Automobile Trade Assn. divided the entire automobile field into four grand divisions as follows:

Div. 1—Electric automobiles.
Div. 2—Gasoline machines, listing at $1500 and under.
Div. 3—Gasoline machines, listing from $1501 to $3,000.
Div. 4—Gasoline machines, listing at $3,000 and over.

Each division is headed by a chairman and a vice-chairman and in addition to these the membership of the division is every dealer selling cars in this price zone. These dealers as a committee meet and settle the "Appraised value." They also pass on the "As is" sales, and the other department of the work. The committee or division meets perhaps three or four times a quarter year. So all four of the divisions work and pass on the market reports for each quarter.

And why should we not have market reports for used cars? We look into our daily papers for the iron and steel reports, the farmer consults them for the prices of cattle and hogs, the broker seeks them for the lists on cotton or corn. True we would not want a daily used-car report, but we have a quarterly one. In its initial scope the prices are based on Chicago only, but this is temporary. Other zones of prices can be included in succeeding volumes. The Pacific Coast dealers can be brought into line and their lists published under those of the Chicago territory. Added to this can be the New England list, perhaps the Southern list, and lists from any other zones that may be deemed desirable. There is no end to the chain of possibilities. In our grain reports we cite Chicago, Minneapolis, Seattle and other places and so in our used-car reports we can cite different territories.

President Allison of the Chicago trade association in speaking of the possibilities of this used-car market report said:

"This establishes every claim that was made in the Chicago Automobile Trade Assn. when its membership selected committees of appraisement, and emphasizes the value of Chicago as a great bourse in which standardization of used-car values has progressed to a practical point, not only for the members of our association but for dealers in every city in the country, where the clearing house method of establishing proper appraisements of used cars is not readily applied.

"If this great city volume of business in used cars does not make for a central market quotation every bit as reliable as the quotations from a stock exchange or board of trade, then all the laws of supply and demand and market conditions fail to operate."

South America Turns to United States

Long List of Commodities Will Be Supplied by This Country but Reconstruction of Financial Conditions Is Necessary

¶ The accompanying article is digested from a summary by Charles M. Pepper in the August 27 issue of Iron Age. Mr. Pepper was for 8 years, prior to June, 1913, foreign trade expert of the State Department at Washington. He has toured extensively through South America and has been a close student of trade in all the South American countries.

THE United States now has the opportunity to supply to the markets of South America commodities which have heretofore been secured from the European belligerents. There will be a deficiency especially in iron and steel products. Germany and Belgium, for the time being, are entirely shut off from the southern Continent and even England, though it may keep the ocean lanes open for its commercial fleet, will find its South American trade dislocated.

While this is the general situation, there is a limitation on the extent to which the United States may profit at once by the deficiency in supplies from Europe. This is the diminished ability of most of the South American countries to buy. The United States, by well-directed effort, may legitimately increase its permanent trade with South America as the result of the war. But too much should not be expected at the outset, because South America during the war period will buy much less abroad than during normal world conditions.

The probability is that the demand for material for harbor and other public improvements, for railroads and for construction enterprises of a public nature will be lessened. The war has paralyzed the ability of the South American countries to borrow money in Europe, and European loans have been the basis of their public improvements and their construction of railroads. Some of these countries were just emerging from commercial crises, due largely to economic causes, and were preparing to refund old loans and secure additional ones.

Brazil was negotiating for a loan of $100,000,000 in London, with some prospect of success. This money cannot now be obtained. Brazil, in fact, has issued an additional volume of paper currency to relieve the stress.

With the Brazilian government restricted in its opportunities for borrowing in order to carry on public improvements, and with private enterprise on a large scale compelled to restrict its activities in railroad building, it will be seen that Brazil is not likely to be a large buyer of certain commodities during the present year. This does not mean any lessening in the value and volume of its permanent market.

Argentina Recovering from Land Speculation

Argentina has been getting on its feet after the monetary crisis which followed the riotous land speculation. Argentine public credit always has been high, and there were some intimations that as conditions improved the effort to float a new government loan, which was abandoned a year ago, might be renewed. The province of Buenos Aires, which was in the market for a railroad loan, was also understood to be on the point of renewing negotiations.

None of these loans can now be floated and some big private enterprises which were dependent on foreign capital will have to be postponed. Argentina, however, is in a position to profit by the war, since the demand for its grain and beef will be increased and higher prices undoubtedly will be obtained. With this source of income assured, Argentina's purchases abroad may not be appreciably lessened on account of the war.

Finances of Chile and Peru

Chile's financial condition has been frequently described as sound, but not sane. That is, the country has abundant resources to meet its financial obligations, but is apt to be reckless in incurring these obligations. Chile will maintain her credit abroad, and will pay all her debts, but she is not likely to get fresh loans with which to carry on public improvements.

Peru was seeking a loan to refund existing loans and meet current obligations when the war broke out. It had no great public improvements under way, and no private construction enterprises of magnitude. Its demand for material therefore may not be materially lessened, but an increase cannot be looked for.

Peru has the gold standard, which helps it in economic and financial crises. The cable reports have stated that the government has authorized the banks to issue checks based on gold to meet the stringency caused by the inability to procure the loan that was sought. Credits may not suffer, but Peru, for the next year, is likely to remain stationary as a buyer of manufactured articles.

The financial and economic situation in these countries is set forth in order that a conservative view may be had of the prospect of the South American market for the United States. American manufacturers and exporters, not familiar with these conditions, might assume that South America would buy next year and this year just as much as it bought last year. If the totals show a falling off in certain lines they might draw misleading conclusions as to the real value of the market and abandon it. This would be a grave mistake.

Having stated some of the drawbacks, it is proper to describe some of the favorable aspects. The purchase of mining machinery is not likely to be altered because mining development goes forward under the most unfavorable conditions. Building and household hardware are not apt to be interfered with, since the demand for these is not affected by international imbroglios. The physical reconstruction of the great city of Buenos Aires will go right on, and the requirements for structural steel, which are so large a factor in its reconstruction, will continue to be large.

Iron and Steel Products—Customs Valuations

The nature of the market of the leading South American countries in detail, as relates to iron and steel products, is exhibited in the customs figures of imports by articles and countries of origin. Unfortunately, however, the statistics are not based on the same system as in the United States. The classifications of the different governments are in no way uniform, each country has its own practice in this regard, and none of them follows classifications similar to those which prevail in the United States.

Most of the South American countries have the system of "aforos," or fixed valuations of different commodities in the customs tariff classifications. Under this practice the value as shown in the manifest given by the exporter to the authorities in the United States may not be the same as the value under the customs classification of the importing country. A typewriter shipped to Argentina may show on the manifest at $50, while the Argentine customs may require it to be valued at $65, or vice versa. The same principle applies to numerous other commodities.

What chiefly concerns the American manufacturer is the commodities which are now imported from European countries, and which may, under the present disturbed conditions, be shifted to the United States if proper effort is made to obtain the trade.

In 1912 Brazil imported $5,368,650 worth of automobiles. Of this amount the United States sent $924,045; Great Britain, $317,873; Germany, $1,526,018; France, $1,470,795 and Belgium, $186,216. The import on motor car accessories amounted to $1,265,430 of which the United States had $110,530; Great Britain, $112,434; Germany, $320,209 and France, $483,508.

The Argentine Republic imported $5,346,149 worth of automobiles. The percentage of this from the United States was but 10.5 while Germany had 15.9 per cent. and France 43.6 per cent. In other words, of the two largest importing countries in the South American field, United States had but 10 per cent. of the business.

Must Buy More from South America

There is a forgotten side to this matter of South American trade. American manufacturers and exporters who are searching for wider markets overlook that some of the countries may also be hunting for expanded markets for their products in the United States. In the present situation it is quite essential that the market for South American products in the United States be enlarged since much of the European market is shut off.

The raw material which may be wanted for the iron and steel and allied industries need in no way be interfered with by the war. The only question is to what extent additional raw products may be absorbed by the industries of the United States.

Manganese, used much in automobile manufacture, exists in Brazil in superabundance, and it can hardly be assumed that the European war interferes with the ability to supply it. In an article on Brazil, published in *The Iron Age* on April 2, the richness of the Brazilian manganese deposits, the facility with which they can be mined and the adequate transportation facilities which now exist were explained. If the iron and steel industry of the United States is embarrassed for lack of Brazilian manganese, it is simply a case of hold-up by the Brazilians.

Big Amazon Rubber Supply

The scare of the automobile industry over a prospective shortage of rubber, because of the war, may or may not be justified, although the supply from the Belgian Congo is undoubtedly in danger, and there may be interference with shipments from the Straits Settlement. But the Amazon has an abundant reserve supply. The hundreds of boats which a few months ago were tied up at Para are doubtless now busy. The jump in the price of Amazon rubber ought to help Brazil through its economic crisis, since the drop in price was one of the prime causes of the trouble.

Chilean copper heretofore has gone largely to England and Germany. The low grade ores from the Braden mine, near Santiago, went to England. Most likely means will be found for absorbing larger quantities of Chilean copper in the United States.

Since the Bethlehem Steel Company's Tofo iron ore mines in Chile were acquired in order to supply the Bethlehem works, there will be none of this traffic to be diverted.

Peruvian copper has been so largely absorbed in the United States that there will not be large additional quantities to be taken by this country, yet there will be some increase.

A final hint may be given on the general subject. Ample data have been gathered by the Department of State and by the Department of Commerce regarding the details of South American trade. The reports of the Consuls to the State Department give much useful information regarding trade conditions. The reports of the Department of Commerce give a vast amount of technical data. What the American manufacturer and exporter should do is to digest this official information carefully and not seek to gulp it down.

United States Banks for South America

NEW YORK CITY, Sept. 1—That American Automobile manufacturers now have the opportunity to repair the damage done to themselves by their own tardiness in seizing the South American opportunity, is the opinion of Ernest E. Ling of the South American Department of the National City Bank.

The application of the National City Bank for the establishment of a branch in Buenos Aires, Argentine Republic and another in Rio de Janeiro, Brazil, is now under consideration by the Federal Reserve Board. Permission will no doubt be granted within a short time for the establishment of these two branches. Mr. Ling, in the course of his work leading up to the establishment of these branches, has closely investigated the financial situation of South America and states that this is but the beginning of wider banking relations between this country and South American nations.

Speaking of the possibilities in this field for the American manufacturer of motor cars, he said, "The automobile manufacturer does not take any risk in seeking the South American business. Of course, he must not expect to find the purchasing power in South America that was there before the war started. Financial conditions in the Southern continent have been much impaired by the war, just as they have been temporarily disarranged in this country. But they are on the eve of a sharp recovery.

"Financial conditions in South America have been bad for the past 7 years due to the wild land speculation engaged in throughout all the important countries. Improvement, however, with the establishment of better commercial relations with the United States, is sure to come and the establishment of better banking connections between New York and the Southern capitals is a big step in the right direction.

"While the purchasing power of South America may not be as high as it was last year nor as high as it will be in a year or two from now, still it will pay the automobile manufacturer to go after this business. He will not be taking any undue amount of risk in doing this, and he now has an opportunity to overcome the effects of his tardiness in securing the South American trade. He has been asleep while the German and French factories have been busy.

"What the South Americans would like to see most is not a single shipment of cars on the orders secured by traveling representatives of the factory, but permanent branches through which dealings could be carried on in a permanent manner and by means of which the owners would be assured of competent service in repairs and parts."

Australasian Trade Has Been Growing

War May Spoil Market—At Outbreak Country Was Very Prosperous—Australia Considering a Tariff

OUR trade with Australasia, which has been rapidly increasing during the past year or two, will probably fall off, on account of the European war. Facts, gathered just before the outbreak of hostilities, show that, while there are peculiar conditions to be met in this part of the world, many American companies had built up a flourishing trade. The country is in a prosperous condition. The wealth of the inhabitants is in the land and the majority of these people can afford cars but the war may prevent buying.

One feature that is worthy of serious attention is the possibility of prohibitive tariffs against imported automobiles. The question of putting a high tax on automobile bodies in order to stimulate the home manufacturers of these commodities is now being considered and extension of this policy would be disastrous to the import trade in motor cars.

"The demand for American automobiles in Australasia is increasing," according to Mr. Henry Kennady, managing director of the Studebaker Corp., of Australasia, Ltd, with headquarters in Sydney, New South Wales, and at the present time on a trip to Detroit—in an interview just before the war.

"Competition with European cars is exceedingly strong and the American automobile agent and representative has no easy task in overcoming this competition. It means everlasting hard work and using of strong, convincing arguments to show the good points of the American motor car. All leading automobiles made in Europe are represented in Australia and they were well known there long before American manufacturers of automobiles had representatives or agents in Australasia. Among the European cars most to be found are the Benz, De Dion-Bouton, Darracq and Brasier.

"The Australians want an automobile with right-hand drive, because in Australia they drive on the left side of the road and not on the right. Cars must have a high clearance, like American cars, because the road conditions are quite similar to those in the United States. There are many sections in the country where there are only sandy roads, others hilly and a great many with rocks. The Australian also wants a car with a four-speed gearset, prefers cars painted gray and having a low appearance, and with a khaki top.

Half of Business in Five Cities

"The bulk of the automobile business, at least 50 per cent., is transacted in five cities. These are the capitals of the states in which they are located: Sydney in New South Wales; Melbourne in Victoria; Adelaide in South Australia; Brisbane in Queensland, and Perth in Western Australia.

"People in the country who want to buy a car go to the big dealers established in those cities instead of going to the nearest located dealer of their city or nearby town. The retail business is conducted on time while the wholesale trade is on a cash basis.

"The farmers buy automobiles and some own several cars and all are as enthusiastic as the city people in reference to automobile matters. There is no prejudice against the automobile and the lawmakers do not spend much of their time in proposing measures which would injure the development of the motor car business. The same refers to the authorities who are well disposed towards the motorists. The taxes are reasonable and the only thing which is now very much needed is the improvement of the roads.

Passing a bullock train near Sydney, New South Wales

"Were it not for the very poor and bad roads there would be many more automobiles sold, but, outside of the city limits of the five big cities and a few smaller ones, the highways are about the worst that could be found.

"There are not many trucks and commercial vehicles and the demand for them is very limited. The cause of this is the fact that the concerns which could really use such vehicles to advantage think that owing to the bad roads, the motor cars would soon give out, and it would cost more to operate them than horses and wagons.

"The conditions of the automobile business in New Zealand are about the same as in Australia, with the difference that the business is not restricted to only a small number of big cities, but is spread over the whole country."

During the first six months of the present year motorcycles, motor car bodies, and motor car chassis to the value of £377,177 were imported into New South Wales. This exceeds the value of the motor imports for the corresponding period of last year by no less than £98,000, equivalent to an increase of 35 per cent.

These figures are significant in that the value of the motor imports for the first six months of last year showed a decrease of 10 per cent. when compared with the imports for the first half of the year 1912, and in consequence of the rapid gain in public favor of the inexpensive American runabout to the detriment, it is said, of the high-class European business, it was generally expected that the values this year would show a further falling off, despite the large numerical increase of cars on the roads of the State. This, however, is shown not to be the case. The United Kingdom still has a lead over all other manufacturing countries in the total value of motor car chassis, bodies, and motorcycles imported, but the United States of America delivered, roughly, £17,000 worth of motor car chassis and bodies more than the United Kingdom. America holds this position partly owing to her manufacturers supplying few other than completely equipped cars, whereas the British makers, as well as the majority of the Continental factories, export their cars in chassis form, leaving the building of the bodies to the Australian dealers, who thereby save a considerable amount in duty.

In the gross imports, including motor cycles, motor car bodies, and motor car chassis, Great Britain comes first with goods valued at £134,042, the United States second with £123,028, Canada third with £44,861, Germany fourth with £27,000, France fifth with £21,439, and Italy sixth with £18,520.

France is the only manufacturing country which has lost ground in her exports to the State during this period. Her motor cycle trade has fallen from £107 to nothing, motor car body trade from £2,081 to £618, and motor chassis trade from £23,362 to £20,821.

In the wheat and wool seasons, all the harbors and ports are congested with ships waiting for the big cargoes that are offering. According to a large dealer in Sydney, writing under date of July 30, "Should anything ever happen that the foreign markets become affected through any cause, such as the present scare through the Austrian-Servian war, conditions in Australia will become bad, and the reverse to general prosperity will immediately set in. As soon as the products of the land cease to find a foreign market, the city trade comes in a very bad way very rapidly. It merely requires a sign of a drought, and depression sets in immediately. Australia has been famous for droughts in the past, and everybody is nervous of the word.

"Everybody on the land who has a small holding, is making money, and this is due to the rapid rise in prices in land products. Foreign buyers all over the world are increasing in number each year, and the last couple of years or so we have had representatives of Libby's, Armour's, and Swift's, well-known in Chicago, giving good prices for sheep and cattle, and there has recently been started a direct service from Australia to American ports with frozen products for these three well-known firms.

"With such rapid rise in prices, money has been flowing very freely into the whole of this country, and the bulk of the money has gone to the man on the land, and he is to-day the most prominent automobile buyer there is in Australia. Every house in the city is advertising in such a way as to draw the attention of the farmer.

May Adopt Tariff on Bodies

"The adoption of a tariff will probably affect the trade in America a great deal. There is a royal Commission sitting in the various States taking evidence on the tariff question and there is every probability that there will be an almost prohibitive tariff imposed upon motor car bodies. The motor car body building business in this country is in a bad way. Practically no companies have any capital behind them and consequently manufacturing is carried on by what one might call amateur methods. Machine work and stamps, etc., are entirely unknown.

"However, as I have said the tariff is likely to be raised to such an extent that bodies on the cars will land here at a great expense. Strange to say the body builders are asking for very high protection against bodies fitted to the cheap American cars; that is their phrase, and as the labor market dominates a great deal in politics in this country, there is every indication of substantial increases.

"Two American small cars are now in Australia and this line of vehicle is going to catch on and thoroughly drown the British cycle car in the matter of numbers of sales. The British car, however, will still live, on account of its superior finish and workmanship, but of course the price is more than double.

"The greatest motoring centers in Australia are New South Wales, Victoria, South Australia and Queensland, in the order named. Western Australia is only a small populated place and is principally a mining center and the interests in the mines are generally owned in the Eastern part of the continent, hence the profits and the wealthy people are living in the East.

"Of the remaining States there is an Island State called Tasmania, about 90 miles in diameter. This little island is very rich in soil, and the whole of Australia is practically fed with fruits and vegetables from it, and a tremendous fruit export, chiefly apples, is carried on each year. Tasmanian apples are well known in the English markets.

"The wealth of the country is in the land. Australia, by reason of its small population, is not a large manufacturing country, although several prominent works are now being started, including two large steel and iron factories. These have just lately been erected, and give promise of a very large industry.

"The main thing Australia depends upon is wheat and wool. New South Wales is a sheep and wool country, and the Southern portion of New South Wales, and the whole of Victoria and South Australia are practically a wheat belt. Without exaggeration, some of the largest farms in the world are to be found in South Australia. There is also a very large wool export both from South Australia and Victoria.

"Queensland is mostly a cattle country, and practically the whole of the beef for Australia comes from Queensland. Along the Queensland coast in prominent towns, are nothing else but huge meat preserving depots, carried out on the same lines as some of the American ones, but of course much smaller. As a matter of fact, there is a lot of American capital invested in these meat works.

"Each of the five States of Australia has great mineral wealth. Queensland is notable for the Great Mount Morgan Copper Mines, also many gold mines, whilst New South Wales is one of the largest coal fields in the world. It is only second to the great Welsh Coal Fields in Great Britain.

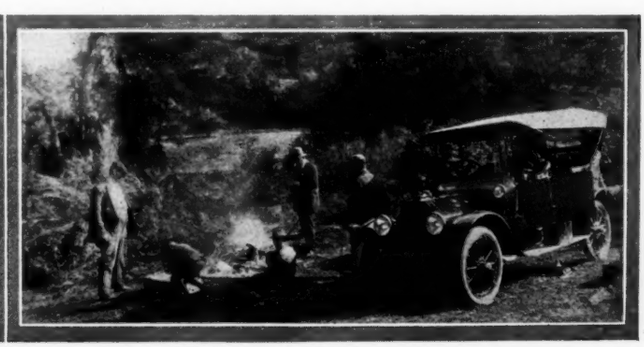
"Victoria is a gold-mining country in one of the first ranks, and so is Western Australia.

"South Australia is very rich in copper. In fact a large portion of the world's supplies comes from Moonta, Kadina and Wallaroo Mines.

"Broken Hill, which commercially belongs to South Australia, but is in the State of New South Wales, is famous for silver and lead mines. The Broken Hill Proprietary claim that they have a greater output of lead than any other mine.

"Thus it is readily seen that with the big production of mineral wealth, also of wool and wheat Australia has to look to foreign markets, and every boat that comes to Australia with general cargo, generally goes away with a full cargo of wool and frozen products, and bullion."

Entrance to Jenoleon cave in the State of New South Wales



Camping party in the Australian bush

The cars lined up in the early morning at Pskow. A scene in the Russian military trials in which automobiles and motor trucks took a prominent part

Russia—A Trade Opportunity

Prejudice Against American Cars Because of Ugly Appearance of Early Types and Rough Finish—Few Attempts Have Been Made to Gain Russian Market—Part III

By the Late E. P. Batzell

¶Editor's Note.—*This article was prepared some time ago by Mr. Batzell and so must be taken as a description of conditions in Russia at the outbreak of the great European war.* The Automobile *is indebted for the illustrations to The Autocar and to the White Company.*

CONCERNING the standing of American cars on the Russian market at the present, it is satisfactory, no make having acquired any particular territory. Even the Ford, which is most advanced in this respect, cannot show any gain over the European cars, as was explained in the preceding installments. In this connection it is interesting that the public reveals a certain well-pronounced prejudice against the American machine, as the writer was able to ascertain by investigation of different parts in Russia. No American car has definitely conquered public antipathy in any part of that country, the Ford selling chiefly through its comparatively low price to the more undiscriminating parties. This situation is not characteristic with other American goods, which are generally well liked there, but one has a hard problem on hand when trying to convince the public as to the merits of an American automobile. Leaving aside the question of price, there is no belief in the even quality and better adaptability to Russian conditions of the American car in comparison with the European, when the matter deals with a car costing about $2,000. Those few who are more or less familiar with automobiles in a technical way and who understand their production are inclined to give due credit to the American machine and the way it is made, reproaching it merely as to its looks.

Early Cars' Appearance Created Prejudice

The American machines indeed possessed a particular appearance until very recently, differing from the general European style, the latter being the more attractive to the tastes of the Russians. Their criticism followed naturally. It is gratifying, however, for the American foreign trade, that the latest and most up-to-date American car creations have successfully overcome this point, by adopting the European style of body, fenders, etc. These will find the door into the Russian market somewhat more open than before, inasmuch as they will meet the taste of the public.

The prejudice existing against the American machines is not only because of their exterior appearance. The much less careful work noticeable on the average product of American factories building cars in large quantities certainly leads the observer to believe that the working and vital parts of the machine are apt to be made equally roughly and with a lack of accuracy essential for their proper functioning. This point of view is further increased by the amateur conception of American production methods in general. A talking point of immense scope thus is available to the dealers in European cars which are smoother, better looking and better balanced in their exterior appearance. The American car and its early efforts to come into the Russian market are both much to blame for this unfavorable reputation, from which it is hard to divert the public now, even by offering them products of much superior quality. Apparently the better American car building firms have not tried to work the various export markets until recently, because their output of cars could be easily distributed and absorbed in the home market without the additional trouble and expense connected with the endeavor of establishing a foreign trade, particularly in a country as little known and as little attractive from the industrial point of view as Russia is. To producers of popular-priced machines in very large quantities, for whom it was impossible to place all their cars in the home market, the export trade offered a good prospect for profits, and thus those cars came into Europe and into Russia. Some introduced their cars through independent agents, other who were building automobiles parallel with other articles already used in Russia, could use the services of the latter representatives. Although the imported machines could have been quite successful in the United

States, with their first appearance repulsed the public, who were used to seeing something much better looking and more carefully made. Nevertheless, the price at which the imported machines were offered made many sales, the buyers trusting that there was good stuff behind the rough exterior appearance. It is to be regretted that only very few of these purchasers have not been disappointed after short period of ownership. In some cases the machine bought was of poor quality, of a make which could not have any standing for its product at home. In other instances the cheap American machine offered at $1,500 to $1,800 in Russia was expected by its owner to do as well as the $3,000 to $4,000 European car of the same weight and power. Nobody will deny, that there can be no comparison between the above two types, because in such an American machine one does not find the materials and workmanship to be found in the European car of double the price. Therefore, the inexperienced owner trying to maintain a pace of 30 miles per hour in his cheap American machine upon the country and cobblestone roads of Russia within a few months' time reduces his car to an annoying rattlebox, at the very best. One can imagine how this owner would feel about his purchase, and, as rumors travel far and wide, the public got to base its dislike on something more concrete than mere appearance. Even now one looks on the American machine generally as a cheap product, not wanted by anybody of a certain standing, just the same as there is a different class of trade for one store than there is for another.

Some reputable American concerns are doing hard work through their agents to establish good reputations for their cars in the public opinion, and they start to have some not unfavorable returns. They sell cars and sell more from year to year, but even the sale of Fords does not approach in number the sale of European high-priced machines, as was mentioned before. The Ford car is finding much use in its inclosed body type for city driving with those who don't care to spend much on an inclosed car for winter only, having a more expensive touring car for the summer.

Large Capital Required by Agents

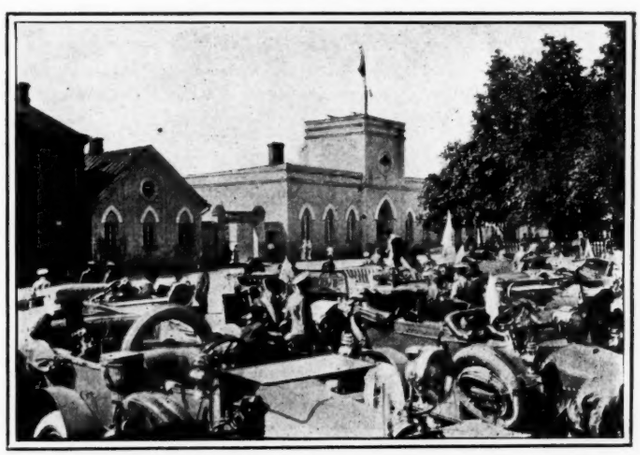
European automobile factories doing big business in Russia almost always have their own branch houses there. This should be preferable for a large scope of business, because many agents, especially those representing German cars, get their stock of the latter practically without deposit, just on commission. When the agent has to pay considerable deposits to the factory for cars received or shipped, he is obliged to possess a large working capital, particularly so if he works in connection with sub-agents. These are generally small parties, who even cannot always devote the whole of their time to the selling of the cars they are representing, and they seldom deposit much of an amount with the main agent who furnishes them cars, until the latter are sold. This method ties up the capital of the main agent if he has to pay for his cars to the factory on their delivery, at the same time being able to get his money back only after the cars are sold to customers. One must keep in mind, that business goes much slower in Russia than here, and whereas an automobile agent here can make a yearly business of tenfold and more than his working capital amounts to by changing it around rapidly, there he must have a much greater proportion of working capital to the yearly business transacted, because it is impossible to turn one's capital around rapidly enough. Only the richest agencies start on a big scale there, the majority growing up gradually, increasing their facilities and their scope of business with their ability to get better credit at the factory which they represent. The Russian agent is said to be a little better off than elsewhere in the matter of storage space for cars arrived in shipment. In many instances he finds it more profitable to let the cars be kept in the warehouses of the carrier, until they are needed, paying a nominal charge for that, than to rent a suitable storage house for them. This method also offers other conveniences.

Garages and Repair Shops Have Difficulties

From the standpoint of service, those buying better and higher-priced machines actually get good satisfaction. As a general rule the agencies and branch houses have their own garages and repair shops, or, if the business is small, they rent space in a garage and shop for their customers' needs. All dealers carry repair parts in stock now and it does not take much time to make a repair or replacement there. Some have shops equipped to make parts to order, serving the owners of old automobiles and those whose cars have no direct representative in the country. Occasionally the agency or branch house does not run its own service garage and repair shop, but contracts with a party well equipped to do this kind of work, where it directs its customers. This latter method is particularly profitable for a small business of late, when, with the use of electricity in cars and some other improvements, they require occasionally the service of expert specialists, which the small business could not afford to hire directly for their exclusive benefit. On the other hand large garages and repair establishments with a large trade of great variety can afford and have such specialists. The arrangement shows some benefit to the owners also, who can deal with the garage, etc., through their agent.

The repair work in branches and private establishments generally is done well, because the reputation of the enter-

(*Concluded on page* 457)



The gathering of the cars at Rjejitza in the Russian military trials

Two White ambulances passing on the road in the Russian military trials

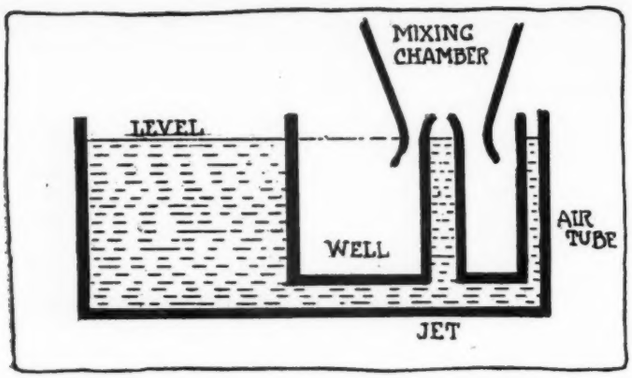


Fig. 1—Diagram showing principle of flooded jet

The Rostrum

Explanation of Flooded Jet

EDITOR THE AUTOMOBILE:—Will you please explain what is meant by the flooded jet and illustrate the working principle upon which it is based.

Atlanta, Ga. H. CORWELL.

—As the name implies, this is a jet placed below the level, Fig. 1, and through which the gasoline tends to flow constantly on account of the difference in levels. In order to eliminate a mechanical means of closing the jet when the motor is not running it is placed at the bottom of a well, the sides of which are slightly higher than the level of the gasoline. When the motor is at rest the well fills up to the level of the gasoline, completely drowning the jet and preventing it from giving off any more gasoline. An air passageway in communication, at one end with the base of the well, and at the other extremity, with the exterior allows air to pass in and carry with it the gasoline given off by the jet.

Well Filled When Motor Is Stationary

When the motor is stationary the well and the passageway are filled up to the corresponding height of the level in the float chamber. As soon as the motor is started a depression is produced in the mixing chamber or throat. The gasoline tends to rise in the well to a height equivalent to this depression. But, as the sides of the well are scarcely any higher than the level, the gasoline leaks or dribbles along the walls of the well and is carried along, at any rate in part, by the lapping effect. At this moment the carburetion is very insufficient because the gasoline that trickles along the outside walls of the well is not vigorously vaporized and carried in by the current of air. The flow of gasoline is then that of an ordinary jet acted upon by the depression which obtains at the orifice of the well. According to the degree that this depression increases the level decreases in the air passageway and as soon as the depression is equal to the column of gasoline which is flooding the jet, the air will enter the passageway, carrying with it the gasoline that remains in the well, and leaving the extremity of the latter, passing into the mixing chamber.

Depression Becomes Double

At that moment there is a discontinuance of the procedure, as the depression which exists in the mixing chamber makes itself felt in the base of the well as soon as it is empty. The moment the gasoline is taken from the well the depression, which was as great as the height of the flooding, suddenly becomes double. Further the flooded jet does not come into operation until the depression is sufficient to expel the gasoline from the well; but at that moment it is stirred up, leaving the orifice of the well, and then intermingles with the air. The gasoline thus expelled, which operation is not the least of the advantages of the flooded jet, makes an effective combination, producing a great mixture even with small depressions, which is equivalent to slow-speed running for picking up and running on a grade.

Determine Acidity with Hydrometer

Editor THE AUTOMOBILE:—1—Is there an instrument made for determining the acidity of a storage battery solution? I do not mean a hydrometer, but something to show when the battery contains the proper amount of acid and water. If there is such an instrument, please describe it and tell the principle on which it works.

2—I have been told that it is a good idea to pour out the battery solution occasionally and replace it with new solution. Do you recommend this?

3—A short time ago I had a pound in my engine which disappeared after having the carbon burned out with oxygen. After running only about 150 miles the pound is beginning to come back.

East Canaan, Conn. D. C. CANFIELD.

—1—There is no simple method of determining the acidity of the electrolyte other than by the specific gravity method which involves the use of the hydrometer.

The acidity could be determined by one of the methods used in quantitative analysis, and while this could be worked out so as to be simply done, it would not be as simple and as convenient as the hydrometer method.

With 100 per cent. sulphuric acid the specific gravity is 1.94, which means that it is 1.89 times as heavy as water at 60 degrees Fahrenheit. It is evident that if water is added to the acid the specific gravity of the solution will decrease, and in exact proportion to the amount of water added, until with no acid the gravity is unity. In other words, the specific gravity of the solution indicates the amount of acid or the acidity.

Possibly you have misunderstood the purpose of the hydrometer. It is not to determine the gravity itself, because that is of no intrinsic importance, but to find out the acidity—the proportion of acid to water. Fig. 2 gives a curve showing the percentage of sulphuric acid in water, for varying densities, at 60 degrees Fahrenheit.

2—This should never be done. You should, however, observe the following directions. Distilled water should be added weekly in summer and twice a month in winter, to replace that lost by evaporation. Add enough water to submerge the tops of the plates by about ½ inch. If distilled water is not available use rain water or melted ice.

If the tops of the plates are uncovered the effective area of the battery cell is reduced. While if too much water is added the cells will slop over.

Never add acid unless you know that some has been spilled out. Every few weeks the gravity of the cell should be determined by means of a hydrometer. The syringe type is

most convenient for this purpose and can be bought anywhere.

The electrolyte of a fully charged cell should, when first put into service, have a specific gravity of about 1.280, and although with age this gravity will change somewhat, the battery will continue to give good service if the solution is between the limits of 1.250 and 1.300. If, on testing the electrolyte, it is found to be above 1.280, with the battery charged, a small amount of the solution should be removed and distilled water added. Make sure, however, that the solution is not allowed to drop more than ½ inch above the tops of the plates.

Low gravity in a battery is usually caused by acid being combined in the plates through lack of charge, although if a battery is upset and acid spilled or a jar is broken and acid leaks out, no amount of charging will restore the gravity.

Battery Should Be Charged First

Before attempting to raise the gravity of any cell by adding acid always charge the battery until sure that a maximum gravity has been reached, or, in other words, until no acid remains combined in the plates. For example, if the electrolyte in a cell should be adjusted to 1.275 when 50 points of acid remained in the plates, the gravity would come up to 1.325 if the cell were afterward charged to the maximum.

To adjust the battery to its proper value, 1.280, first bring the battery to its true maximum, which can only be assured by charging until no further rise in gravity is noted during a period of at least 24 hours of continuous charging at one-half the normal finishing rate. Then if the gravity is too high remove the electrolyte down to the tops of the plates and replace with water or 1.300 electrolyte as required.

3—The knock is probably due to some other cause than carbon, if the removal was complete. But without more details concerning the sound made it is impossible to say exactly where the trouble is. Lack of oil or improper cooling would cause a knock, but as you are using a large amount of oil it hardly can be the former. See that the water is circulating properly and that the fan belt is tight.

Next see that the compression is good in all the cylinders and that the spark lever is working properly. It is possible that some part of the linkage is loose, so that when the lever is moved the spark is not retarded. If the carbureter is not in good adjustment it should be attended to, because a poor mixture will cause a knock.

Possibly there is play in one of the motor bearings. If the knock is more perceptible when the motor is being slowed down, it is likely that this is the case.

Gasoline Consumption Low

Editor THE AUTOMOBILE:—1—I would like to know whether I could cut down my gasoline bill by putting on a new carbureter, as the one I now have gives me only 8 miles per gallon. My machine is a 1912 Palmer-Singer, having a carbureter of the three-jet type of the same make. The motor is the T-head type. This car weighs 5,300 pounds. Is the carbureter O. K.?

2—If the carbureter is O. K. what could I gain in miles by fitting another magneto to fire over the exhaust valves?

3—Where could I buy new caps for plugs for this car?

Swedesboro, N. J. T. H. BOLTON.

—1—This car should give about 10 miles per gallon in ordinary driving where a reasonable amount of stops are made and a certain mileage is spent in driving around the town or city. Where country driving at a good rate of speed is indulged in, the mileage per gallon should be somewhat above this figure.

It is possible that your carbureter is out of adjustment. By cutting down on the strength of the mixture your fuel bill should diminish.

See that the compression is good and that the valve timing is correct. Push the car over the garage floor, and if it takes much effort, look for friction in the running gear. Possibly the brakes are dragging.

Drive with your spark as far advanced as possible at all times without causing the motor to knock. Also see that the breaker points are in adjustment.

2—We do not believe that a noticeable increase in economy would result from the fitting of an extra set of spark plugs.

3—New plugs can be obtained from the Singer Motor Co., Jackson avenue, Long Island City.

Motor Overheats in 10 Miles

Editor THE AUTOMOBILE:—I have a 1913 six, seven-passenger touring car, that has been giving me a lot of trouble through overheating. It has been run about 4,000 miles and had a tendency, from the beginning, to overheat. I called the dealer's attention to the fact soon after I bought the car, but he told me it would get better after the car had been run a while, but instead has been getting worse, until at the present time I am unable to run any more than 8 or 10 miles before the water begins to boil in the radiator, and that on level country roads. I have taken it to several automobile machine shops without any results. They all declare the timing to be right; the fan seems to be working all right, so is the pump. We can find no obstruction in water lines and there seems to be nothing wrong in the timing or water circulation. The magneto is advanced as far as possible, and I am using as lean a mixture as possible. The car has a world of power and could not work any better up until the time that it begins to boil, when, of course, I have to stop and let her cool off and refill the radiator. The car is equipped with a Rayfield carbureter and Splitdorf magneto.

Ogden, Utah. J. W. L.

—You have named practically all the conditions that might cause overheating, yet since the trouble is still there it would seem that the search has not been thorough enough.

Overheating may be due to a defect in the cooling system, rich mixture, retarded spark, improper lubrication or incorrect valve timing, and possibly a slipping clutch or excessive friction in the chassis.

Under the first head there are several places that there might be difficulty. First determine that the water is circulating properly by emptying enough water out of the system to uncover the return connection to the top of the radiator. Then with the motor running note whether the water flows freely. If it does not, fill the radiator full of water and run the motor until the water boils. Then feel the various parts of the cooling system, noting the relative temperatures. For instance, if there is an obstruction in the return water header, such as a piece of loose rubber, the water on one side of the obstruction will be hot and on the other cool.

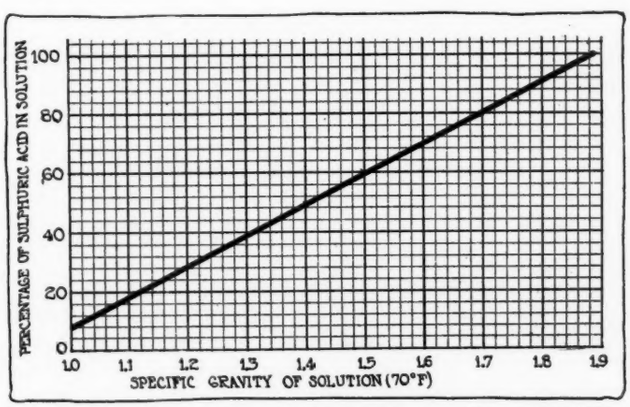


Fig. 2—Curve showing the specific gravity of various percentages of sulphuric acid and water

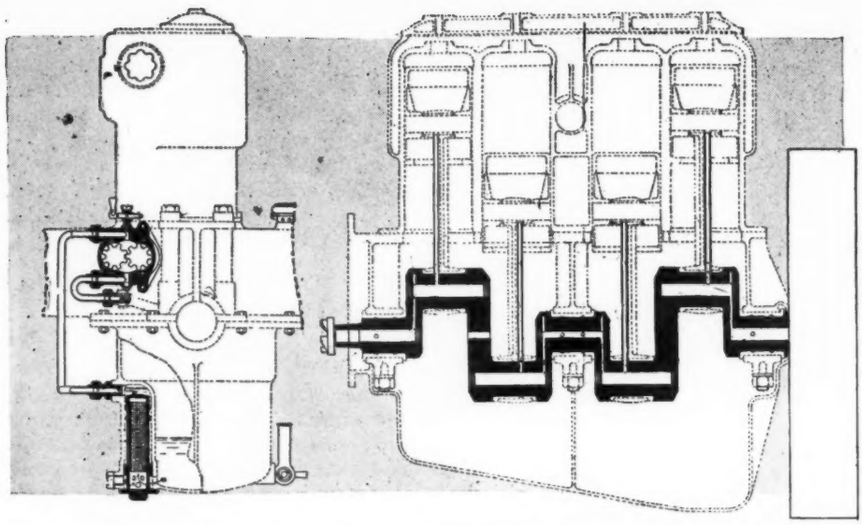


Fig. 3—Two views of the Lancia motor showing the oiling system. It is a force feed type in which oil is carried to all the bearings through a hollow crankshaft

Similarly, if the pump is not operating, due to a broken vane or to a sheared pin that holds the vane to the shaft, then the return header will be very hot, while the lower part of the radiator and the connection from thence to the pump will be cool. If the radiator is clogged up, the top should be very hot and the bottom cooler than usually. It may be that there is sand or some other obstruction in the water jackets. If the trouble cannot be found after diligent search it would be advisable to change the radiator. It may be that the fan belt is too loose.

While you may drive with the spark lever properly advanced and the magneto may be correctly timed, it is possible that the linkage connecting the spark lever with the magneto is loose, so that when the lever is advanced the breaker box is not acted upon.

See that the lubrication system is in proper working order and check up the valve timing.

Installing Spark Advanced on Lancia

Editor THE AUTOMOBILE:—I have recently purchased a four-cylinder 1909 Lancia with runabout body, 3.5 by 4.5-inch bore and stroke, cylinders cast in pairs, Bosch ignition, four-speed gearset.

1—What are the gear ratios? Is fourth speed direct?

2—The engine consumes, as near as I can measure, 1 gallon of oil per 225 miles, and consumes exactly 1 gallon gasoline per 19.6 miles. Are these figures unusual?

3—The magneto is set three-quarters full advance and has no timing control. Unless I get the car rolling at not less than 25 miles per hour it will not take any moderate grade on fourth without knocking. I find I am using third speed more than half the time, and do an excessive amount of changing between third and fourth speeds. I am told by experienced drivers that a car of this type, geared high on fourth speed, is managed differently than the usual three-speed American car, which is geared lower on high speed, and that it is customary to do a lot of gear shifting in place of manipulating the spark.

On third speed the car will take with ease all but the most precipitous hills. It knocks sharply on fourth speed if the throttle is not opened very gradually and delicately.

4—A very pronounced singing comes from transmission on first, second and, above all, third speed, but with four-speed it is noiseless. Does this mean excessive wear? The sound is musical rather than discordant.

5—Please describe the oiling system in full. A gallon reservoir with gauge leads to a rotary pump and thence by numerous leads to the bearings, apparently. Is there a splash system combined? And how is excessive oiling prevented?

LAWRENCE W. WHITE.

Milton, Mass.

—1—Fourth speed is direct. Several gear ratios are used on this car, but the common one is 4 to 1 on high, 6 to 1 on third, 8.5 to 1 on second, 13 to 1 on low.

2—The oil consumption is normal and the gasoline consumption excellent. The oil reservoir in the base of the motor holds over 2 gallons, and this should be changed every 500 miles by removing the plug at the base on the left side, Fig. 3. Take the strainer out and clean it. Put it back and replace the plug. Then flush the motor with kerosene, which is put in through the oil filler opening. Crank the motor over several times until the kerosene has penetrated to every part and then drain it out. After this the base should be filled with oil.

3—The knocking in your motor is not unusual in a car of this type, although it should not be necessary to use third as often as you state. It may be caused, as you suggest, by the early occurrence of the spark, and also to some extent by the carbureter.

In the first place it appears likely that the magneto is set too far in advance. It should be timed so that the breaker points are separating when the mark AA on the flywheel is at the top. But even with the spark so timed the motor may knock, and if the carbureter is found to be in good condition it is advisable to fit a spark advance, as will be described later.

There is no adjustmet to the carbureter except that obtained by filing the edge of the throttle valve, which is a cylindrical one. This should be left to a man that has had experience with this car. Part of the knocking, however, may be the result of dirt in the low-speed nozzle of the carbureter.

This carbureter has a large jet and a low-speed jet. The latter is located at the base of the tube that runs up the side of the main passageway. At the base of this pipe is the low-speed jet, which is so small that daylight can barely be seen through the aperture. Clean away any dirt that may be stopping up this hole and also wash all dirt out of the float chamber. If you have no strainer or sediment trap to catch the water before it reaches the carbureter, it would be wise to install one.

If it is found that the motor still knocks to a noticeable extent you should install a spark advance, as shown in Fig. 4. Return the magneto to the Bosch Magneto Co., 224 West 46th street, New York City, and have a new breaker box fitted, so that the spark can be advanced. Have the arm on the breaker box on the side next to the motor. The charge for doing this is small, but depends on the condition of the magneto, so that no definite figure can be stated.

Bowden Wire Spark Advance Used

A simple mechanism for controlling the movement of the breaker from the steering post is sold by the J. S. Bretz Co., 250 West 54th street, New York City. It consists of a spark lever that is clamped to the wheel, a flexible tube in which is carried a Bowden wire and a bracket to hold the lower end of the flexible tube in place. The spark is advanced by the pull of the cable and the return is accomplished through the spring shown. The friction in the advance lever is sufficient to hold the lever in any position in which it is set. This is accomplished by means of a small helical spring.

The bracket may be bolted to the crankcase, as shown, it merely being necessary to remove one of the bolts holding the two halves of the crankcase together and installing the bracket. Before this is done a hole must be drilled in the end of the bracket.

After the bracket is in place it should be bent by hand until the fitting through which the cable emerges is in line with the eye or hole in the breaker arm.

Be careful to order enough flexible tubing. The cable should be a few inches longer than the tubing.

Next take the spark lever fitting apart and fasten the back of it to the steering post. Then slip the cable in place, fasten it solidly and put the lever back in place. Slip the flexible tubing over the cable and pass the latter through the hole in the dash and fasten the end to the fitting on the bracket attached to the crankcase. With the spark lever at retard and the breaker box in the same position, fasten the cable solidly to the breaker arm by means of the yoked fitting shown. Finally tighten up the nuts that hold the cable in place. It only remains to attach the spring that returns the breaker to retard position and this is fastened at its upper end to the cylinder casting, as shown.

In timing the magneto set it so that with the breaker retarded the points separate when dead center is reached.

4—While the gearset may be noisy, it does not necessarily mean that any replacements need be made. Take off the gear-case cover and examine the shafts for play and note whether the teeth are in good condition. If any of the gears are very badly worn they should be replaced, and if there is any large amount of play when the shafts are shaken by hand, new bearings will be needed.

5—Lubrication is accomplished by a pressure system, Fig. 3, which delivers oil to all the bearings. The main bearings are lubricated directly from the main oil pipe. The crankpin bearings obtain oil from the main bearings by means of a hollow crankshaft, and from these bearings the oil is fed to the wristpins through tubes that are attached to the connecting-rods. From here the oil flows to the cylinder walls.

To go more into detail. The oil passes from the main feed pipe by means of canals cut into the main bearings, to the crankshaft bearings and to the timing gears. It continues to flow and enters the crankshaft itself through the small holes shown in the journals. The oil then passes through the crank arms and out into the copper tubes which carry it to the wrist-pin bearings and from thence out through the wrist-pins to the cylinder walls.

Oil circulation is maintained by a gear pump mounted on the back end of the camshaft. The pump obtains its supply from a 9-gallon reservoir in the base of the crankcase.

Pressure is automatically regulated by means of a bypass valve or oil pressure governor, at the side of the crankcase. The excess pressure opens this valve and allows the surplus oil to return to the reservoir.

The height to fill the crankcase to is determined by means of the stand pipe, or drip cock, depending on the model, at the side of the crankcase.

Double-Acting Motor Complicated

Editor THE AUTOMOBILE:—I would like to have your opinion of a double-acting four-cycle motor. I have been granted a patent on a motor that receives a firing impulse above and below the pistons.

Richmond, Ind. EDWARD L. YOUNG.

—While we do not know anythig about your particular motor the general objections to double-acting motors for automobiles are that it is too difficult to cool the stuffing box required around the piston rod; that there is danger of pre-ignition and warping of the piston due to the fact that it is exposed to intense heat on both sides; that such a motor must be a great deal higher, due, first of all, to the fact that there are two combustion chambers in the same vertical line, and also because a cross-head construction must be used.

To Cut Sheet Metal in a Vise

Editor THE AUTOMOBILE:—I have seen many a man go through all kinds of performances in cutting a strip off of a piece of thin sheet metal. Some use hack saws, some lay the sheet metal flat on a block of lead and drive a chisel through along a scratch line, and others will bend the sheet along the aforesaid scratch to an acute angle then bend the sheet straight again, etc., etc., until the break comes along the desired place.

The simplest way to cut sheet metal, provided it can be inserted into a vise, is shown in Fig. 5. Clamp the edge of the vise jaws along the line to be cut, and with the cutting edge of the chisel pressed down against the top of the vise, but as nearly at right angles as possible to the sheet metal, drive the chisel along with the hammer.

The cut made in this way is clean, accurate and easy. If you have never tried it, its simplicity will surprise you.

New York City. W. F. SCHAPHORST.

Manufacturer of Bergdoll Motors

Editor THE AUTOMOBILE:—Please publish in your next issue who manufactures the Bergdoll motor which is used in the Bergdoll 40 car.

St. Louis. E. EDWARDS.

—Write the Louis J. Bergdoll Co., Philadelphia, Pa.

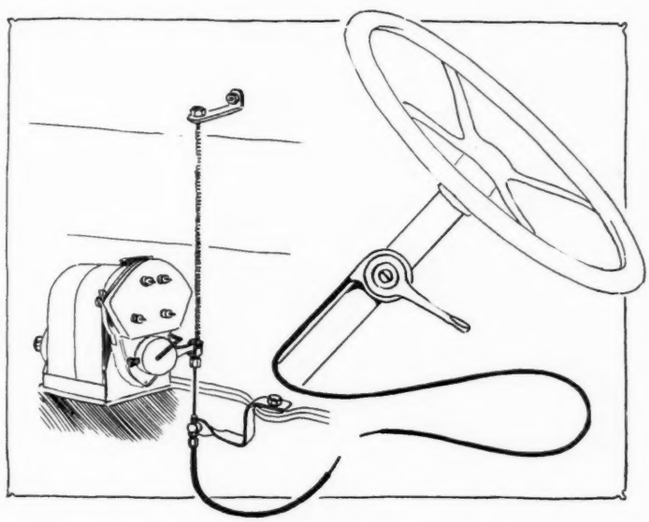


Fig. 4—Spark advance installed on 1909 Lancia. The lower end of the flexible cable is held in a bracket attached to the crankcase. This bracket is bent into shape by hand. The breaker is returned by means of the spring which is attached at its upper end to bracket that is bolted to one of the studs on the exhaust plate.

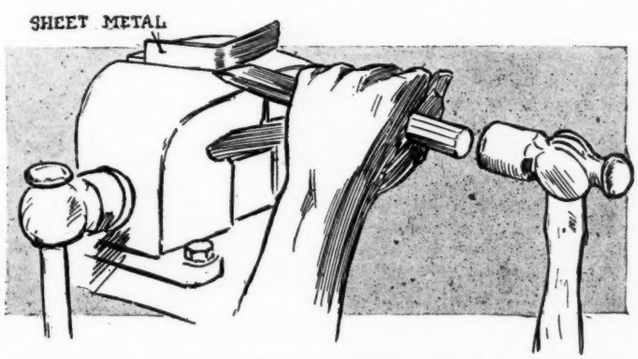


Fig. 5—Method of cutting sheet metal with a cold chisel and a vise

The Engineering Digest

Elements in Gearing and Clutches Serving to Avoid Jerky Starts and Needless Wear of Tires

EDITORIAL NOTE—The study which is presented herewith relating to the mechanics involved in the starting of a vehicle from an internal-combustion motor, is believed to be the first of its kind. The author seems to feel the difficulties and to grope his way toward definite conclusions. The language in the German original is super-condensed, uninviting and non-committal. But the equations which the author has gathered and the figures deduced from them to show the extent of the slip-movements involved in starting a vehicle, form an excellent basis for further attempts at digging out of the subject what there should be in it with regard to the proper relations of clutches, transmission gears, vehicle weights, motor sizes and speeds and several minor design features—a large subject which has been especially neglected, so far as theory and practical refinements are concerned, and which is especially important with regard to vehicles intended for carrying heavy and variable loads.

If, in contrast to what the author means to convey, it may be shown that heavy loads in reality may be started easily from a small high-speed motor working through any ordinary clutch—on average or poor roads and without slipping of the driving-wheels—or if, on the other hand, the opposite is shown to be true, something would evidently be gained toward getting at the reasons for the very different starting-qualities actually observed in different makes of trucks, delivery wagons and omnibuses. The essay of Mr. Achilles conveniently supplies some of the reasoning-material which might be used for this purpose.

The question of the feasibility of using small motors of high speed for heavy work is among the most important ones on which an elaboration of the subject would shed light.

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WHEN a motor vehicle is so constituted that skilful slipping of the clutch and manipulation of the throttle are required in order to avoid jerky starts or the spinning of the driving-wheels, with the tires in frictional contact with the ground, it is to that extent less perfect than one which can be handled more carelessly or less skilfully without undesirable consequences. F. Achilles, an engineer of Mannheim, Germany, examines the factors which must be considered in the design of cars with reference to this matter, assuming at first that the motor runs at a certain regular speed and that the clutch has no slip. The argument may be rendered as follows:

It is necessary to know the difference in the distance covered by the actual acceleration of the vehicle from a standstill and that which would be covered if the driving-wheels followed the motor, without retarding it, during the time occupied by the acceleration.

If the motor at the starting runs with N turns per minute and the factor of total speed reduction on the lowest gear is U, the driving-wheels make n turns, n being equal to N divided by U. With a wheel diameter D the vehicle would then have a uniform speed of V meters per minute, V equalling $\pi D n$. Conforming with the custom of having V stand for meters per second, we have $V = \frac{\pi D n}{60}$. The distance S covered by the vehicle in the time T is VT.

On the other hand, the motor applies a torque which, with the transmission ratio and the diameter of the driving-wheel duly considered, gives a pull Z at the point of tire contact with the ground. After deducting the value representing the starting-friction there remains a surplus Z_1 for the acceleration of the vehicle. The value of the acceleration P involves the weight of the vehicle G and the acceleration factor $g = 9.81$ meters (corresponding to 32.20 feet), making $P = \frac{Z_1 \times 9.81}{G}$, and with this acceleration there is in the time T covered a distance $s = \frac{PT^2}{2}$.

For a given time T it is thus simple to figure the difference in the distances. But it is of more importance to know what the maximum difference in the distances amounts to and at what time it occurs. When P and T are given, these are the factors to be determined. Calling the maximum difference Y, one has $Y = S - s = VT - \frac{PT^2}{2}$, in which the greatest value for Y is obtained (according to simple maxima-and-minima rule) when $T = \frac{V}{P}$. Inserting this value, one has

$$Y = \frac{V^2}{P} - \frac{V^2}{2P} = \frac{V^2}{2P}$$

Still more directly of interest than the difference in distances at the circumference of the driving-wheel is perhaps the same factor expressed in revolutions of the driving-wheel. In other words, the difference is to be expressed between $n_v = \frac{VT}{\pi D}$, which is the number of revolutions which the driving-wheel would make in the time T from the beginning of the starting with the vehicle speed V and, on the other hand, $n_p = \frac{PT^2}{2\pi D}$, being the number of revolutions of the driving-wheel in the time T with the acceleration P beginning at the start. The maximum value is found exactly as above, with insertion of the value for $T = \frac{V}{P}$ which gives the maximum value for the difference sought, and the latter is thus seen to be $Y_n = \frac{V^2}{2P\pi D}$

To illustrate the meaning of these general values it may be

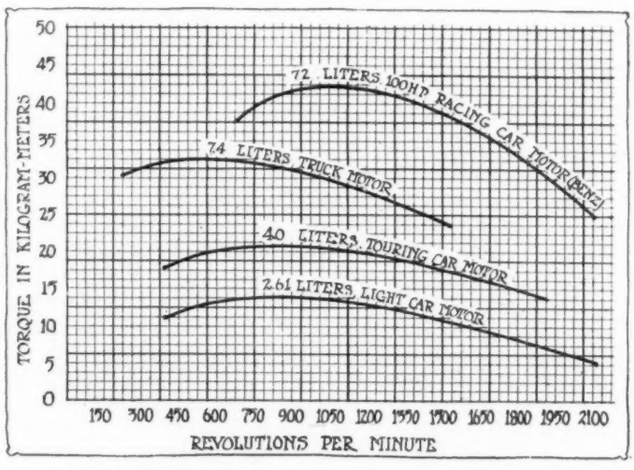


Fig. 1—Comparative torque curves of different vehicles

advisable to give also a general example. Let it be assumed, then, that a motor vehicle has a wheel diameter D = 1 meter and with its lowest admissible motor speed and its greatest speed reduction gives a uniform vehicle speed V of 1.5 meter per second and by its pull gives an acceleration P = 1.5 meter per second. With these data the figures obtained from the preceding equations may then be arranged in the following table:

TIMING OF MAXIMUM SLIP IN STARTING

Time from beginning of start T = (seconds)	1/10	1/5	¼	½	¾	1	1¼	1½	2
Distance covered S = ...(meters)	.15	.3	.375	.75	1.125	1.5	1.875	2.25	3.0
Distance covered s = ...(meters)	.0075	.03	.047	.1875	.425	.75	1.175	1.7	3.0
Difference S—s = ...(meters)	.1425	.27	.328	.667	.70	.75	.70	.55	0
Revolutions with motor speed V; n_v =	.048	.096	.12	.24	.36	.48	.60	.72	.96
Revolutions with acceleration P; n_p =	.0024	.0096	.015	.06	.14	.24	.38	.54	.96
Difference, $n_v - n_p$ = ...(revolutions)	.0456	.086	.105	.18	.22	.24	.22	.18	0

In this example, it will be noticed, the maximum differences in the movements occur when T = 1 second.

It is now necessary to compare practice with the principles of movement expressed in this schedule of figures. In reality the motor is not coupled rigidly with the transmission gear. The friction clutch creates the possibility for reconciling the differences in movement. When it is considered, however, that these differences are U times greater in the clutch than in the driving-wheels, it is plain that they may tax the clutch surfaces unduly. In the case of the scheduled example, where U is 16, as common for touring cars, a maximum difference of .24 × 16 = 3.8 revolutions is obtained for the driving and the driven portions of the clutch. In other words, during the first second of the start the driven portion of the clutch must be allowed to slip 3.8 revolutions.

[While the author means to show principally that it is desirable in the designing of a car to take close account of the relations between speed and torque of the various revolving parts, in order to be able to proportion the clutch and the gears, and even the wheels, suitably for the work expected of the vehicle and its driver, it is clear that his argument bears with equal force upon the advantages to be derived by bringing all slip movements under the most facile control without resorting to extraordinary maintenance care of the slipping surfaces or to extraordinary demands for operative skill on the part of the driver. Indirectly the merits of a good hydraulic clutch, especially for the heavy load-carrying vehicles in which the torque of the wheelshafts necessarily must be considerable, thus enter in the subject, as well as the question of the preference for one or another of the standard types of clutch, according to the nature and purposes of the vehicle involved in each case.—ED.]

How Tires Are Affected

The movement required of the clutch is of considerable importance. But there are other elements in which the required movements can be equalized. The yielding properties of rubber tires, especially air tires, admit of some displacement in the direction of motion. But the principal element of this nature comes into existence through slipping of the driving-wheels on the road after overcoming the road friction. The condition for having this element come into action is that the driving-pull at the tire circumference, with the lowest gear in mesh and the motor at the lowest speed which may be depended upon to start the vehicle, is in excess of the resistance to the sliding of the two wheels. If this condition exists and is aggravated by lack of skill on the part of the driver it becomes the cause for abrasion of the tires at every start.

On the whole, in order to be able to start at all, there must be the possibility for

(1) either slipping the clutch to allow for the difference in movement, and the clutch spring pressure must in that case be adjusted to correspond to the torque resistance;

(2) or slipping of the driving-wheels on the road surface, and in that case the road friction and the required pull at the tire circumference must correspond;

(3) or a movement in the transmission gearing admitting of the equalizing of the different movements.

In order to know in advance how a certain vehicle will act at the starting, the numerical value of the following factors must be known:

(1) Total weight G of the vehicle; (2) G_w, being the portion of G resting upon the driving-wheels; (3) diameter of driving-wheels D; (4) Factor U of speed reduction in the transmission from motor to wheelshaft on lowest gear speed; (5) power development of the motor throughout the lower range of motor speeds.

With regard to the latter factor, which must take the form of a schedule of figures or a torque curve like those shown in Fig. 1—giving comparative torque curves for several vehicles—the well-known fact is to be noted that each motor produces its highest pull and torque at a certain number of revolutions depending in each case on its design (see Fig. 1). At the starting, under the throttle, the number of revolutions will drop till the pull produced by the motor corresponds to the frictional resistance to rotation at the tire circumferences. At that moment the highest available pull of the highest torque is realized.

The maximum motor torque is to be figured from the mean piston pressure p, which may be done in the simplest manner by counting on .8 p for each liter of cylinder volume. And from the number of kilogram-meters motor torque so obtained the effective torque can be figured under the assumption of a mechanical efficiency in the transmission of 70 to 75 per cent., and the driving pull at the tire circumference can be determined from the wheelshaft torque when the wheel radius is known.

The starting speed of the vehicle must be determined from the number of motor revolutions giving the necessary pull.

Finally there is required knowledge of the friction coefficients on different road surfaces. These figures may be about as follows:

Ordinary macadam—rubber tires 50 to 60 per cent.; iron tires 40 to 50 per cent.

Better macadam—rubber 40 to 50 per cent.; iron 30 to 40 per cent.

Stone pavement—rubber 30 to 40 per cent.; iron 25 to 30 per cent.

Wood blocks—rubber 30 to 35 per cent.; iron 20 to 25 per cent.

Asphalt—rubber 20 to 30 per cent.; iron 15 to 25 per cent.

With this material arranged it is possible to illustrate the previous reasoning by definite examples. Let the first one refer to a light 10-tax-horsepower car with a cylinder volume of 2.61 liters. Out of the total weight of 1,500 kilograms, everything up, 900 kilograms come on the rear axle. Let the wheel diameter, including tire, be 820 millimeters and 16 the factor of the transmission ratio on low gear. On the supposition of a mean effective piston pressure of 6.5 kilograms per square centimeter there is found to be a motor shaft torque of 13.6 kilogram-meters and at the tire circumference, with the 75 per cent. efficiency in the transmission and the transmission ratio of 1 to 16, a torque of 162 kilogram-meters. Out of this torque a pull of 400 kilograms becomes available at the tire circumference, and, figuring on using about 50 kilograms to overcome the starting-fric-

tion, there remains a pull of 350 kilograms for acceleration. This has an acceleration value $P = \frac{350 \times 9.81}{1,500} = 2.3$ meters per second.

As it is further to be assumed that the maximum torque is furnished by the motor at 600 revolutions per minute, the coupling should take place at this speed, and the vehicle speed V corresponding to this motor speed, being $V = \frac{600 \times \pi \times D}{16 \times 60} = 1.6$ meter per second, is the one to be considered in the figuring.

With these figures the time T after which the difference between S and s reaches maximum is determined as before by giving T the value $\frac{V}{P} = \frac{1.6}{2.3} = .7$ second, because this value for T gives maximum value to $Y = S - s$ in the equation $Y = S - s = VT\frac{PT^2}{2}$

The greatest difference Y in road distances—according to whether motor speed or available torque is made the basis for the determination—is on the same plan found to be

$$Y = \frac{V^2}{2P} = \frac{1.6^2}{4.6} = .55 \text{ meter}$$

and the greatest difference in the movements as expressed in revolutions Yn of the driving wheels, being Y divided by πD, is seen to equal $\frac{.55}{\pi D} = .215$ revolution.

The difference in revolutions of the motorshaft is of course 16 times as large, or $16 \times .215 = 3.45$ revolutions.

TABLE SHOWING VARIATIONS IN CONDITIONS FOR USE OF CLUTCH

Type of Vehicle	40 H.P. Car	70 H.P. Car	100 H.P. Benz Racer	3-Ton Truck	5-Ton Truck	6-Ton Military Truck with Trailer
Cylinder volume, liters	4.0	8.0	7.2	5.2	7.4	7.4
Vehicle weight, kilograms	1,750	2,200	1,540	5,600	9,000	12,000
Weight on driving-wheels, kgs	1,050	1,350	860	3,300	5,400	4,800
Mean effective piston pressure referred to motorshaft, in kilograms per square centimeter	6.5	6.5	7.0	5.5	5.5	5.5
Torque of motorshaft, in kilogram-meters	20.8	41.6	40.25	22.8	32.5	32.5
Total transmission ratio, U	15	10.25	6.65	37	37	57
Torque of wheelshafts, kilogram-meters	235	325	200	630	900	1,300
Diameter of driving-wheels, meters	.880	.935	.810	.930	.930	1.030
Pull at the wheelrims, kilograms	535	690	495	1.350	1.950	2.550
Co-eff. of road friction corresponding to driving-pull, per cent	510	510	570	410	360	530
Available acceleration P, meters per second	2.75	2.95	3.4	2.1	1.85	1.80
Motorspeed giving max. torque, N, rev. per minute	700	500	800	400	400	400
Vehicle speed corresponding to N, meters per second	2.15	2.35	5.1	.66	.66	.38
Time T of max. slip movement, $T = \frac{V}{P}$, in seconds	.75	.80	1.5	.32	.36	.21
Max. road difference, $Y = \frac{V^2}{2p}$, in meters	.83	.93	3.75	.104	.117	.04
Max. diff. in wheel rev., $Y_n = \frac{V^2}{2P\pi D}$	.3	.315	1.46	.036	.04	.012
Max. slip in clutch, in revolutions	4.5	3.3	9.75	1.25	1.5	.73

If it is further considered that a pull of 400 kilograms can be applied through driving-wheels under a load of 900 kilograms only when the co-efficient of road friction gives a minimum resistance against slipping of the wheels of $\frac{400 \times 1,000}{900} = 44.5$ per cent., the inferences relating to practical operation of such a car as referred to in the example may be formulated as follows:

With a rigidly acting clutch the driving-wheels will slip to the extent shown on a road surface having a friction co-efficient exactly corresponding to the torque required for starting the vehicle. On roads with smaller friction the slipping will occur at the application of a smaller torque, and in considerably aggravated degree because under that condition the acceleration is smaller. On roads with higher friction the vehicle will remain on the spot if the clutch cannot be slipped the required amount.

The appended table gives numerical values for the factors of interest, as applied to six other standard automobile types.

It is left to the reader to draw conclusions from these figures with regard to the properties required of the clutches and the sizes of motors by which the necessary starting torque may be produced at a motor speed sufficiently low not to tax the clutches actually available too severely.—From *Auto-Technik*, July 4.

Hydraulic Clutch with Ball Pistons Made in England

CONSIDERABLE activity is noticed, mainly in this country and in England, aimed at the improving of hydraulic mechanism for the transmission of power and foreshadows perhaps the time when cheap and very durable devices of this class will take the place in automobiles of friction clutches and toothed transmission gears. If the mechanical efficiency of the perfected hydraulic element may not be expected to equal that of refined gears when these are new, it may on the other hand be relied upon to remain practically the same for a number of years, while cheapness and lightness must be assured in the final outcome through the avoidance of costly machining and hardening of parts and through the equable distribution of stresses. The use of packings, to obviate leakage along the shafts, is still an important drawback in hydraulic devices of small dimensions, but the improvements of recent years usually include provisions for returning leaked-out oil to the circulation system—as, for example, in the Hele-Shaw hydraulic gear for ships and motor trucks—and thereby allow the use of packings which are relatively loose and not subject to much wear.

It is naturally in the easier applications of the hydraulic principle that the improvements take the most acceptable form. Pumps with fixed capacity, for each shaft revolution, and hydraulic clutches—from which only a graduated slip but not a changeable torque is required—are first to bid for serious practical attention from automobile builders, while the more complicated devices meant to take the place of the four-speed gearbox still present themselves with too many interrogation points to the critical engineer bent on safe results.

The hydraulic clutch becomes of special interest in connection with the design problems submitted by Mr. Achilles of Germany in the preceding article, relating to the starting of vehicles and clutch maintenance. A clutch of this class is one of four hydraulic mechanisms brought out by R. F. Carey of Variable Pumps and Motors, Limited, of England, and the main features of its design are shown in Fig. 2. One of the innovations is the use of steel balls as pistons, and this is also found in the three other mechanisms designed by him, comprising a pump with fixed capacity, one with variable capacity and a variable-torque transmission.

The driving-shaft or rotor A of the clutch is fixedly secured to the steel cylinder F which is formed with six radial pump bores containing snugly fitting steel ball pistons and is mounted eccentrically in the driven casing, comprising parts G and B, by means of ball bearings HH. Between the two portions of the casing there is mounted the hardened steel ring J which forms a track limiting the in-and-out movements of the steel balls, eccentrically, so as to cause the balls to reciprocate in the pump bores when the rotor is revolved. This track is held in position by the same bolts that hold G and B together. Centrifugal force holds the balls against the track, and the friction with it gives the balls a rotary movement while they are being reciprocated. The apparatus, in the dimensions shown in the drawing, is intended to transmit 20 horsepowers at 1,000 revolutions per minute.

In the position shown the casing will remain stationary when A is revolved, the oil simply circulating among the cylinders, but by moving the clutch ring C to the left the valve body D, whose inner end is a cylinder ground to fit in a central longitudinal bore in the rotor, is moved by means of the transverse pin K and obstructs more or less the communication from one pump bore to another. Pressure then rises in those bores in which the steel balls are being driven inwardly by reason of their relations to the track J, and the friction created with the track eventually causes the casing to be carried along with the rotor. The more completely D obstructs the oil flow the less is of course the slippage which takes place. When D separates the bores entirely, except for the internal leakage along the contacting surfaces, B will move at almost the same speed as A. At this point the connection can be made positive by moving D a little further, as then the dog clutch L is brought into engagement with corresponding dogs MM on the rotor, the slowness of the relative movement of the two parts rendering it easy to effect the engagement without clash of the dogs.

The box E carried on the rotor shaft is connected to an oil reservoir and is used for filling the apparatus. It also provides for expansion of the oil and for the displacement of oil which is due to forcing the body of D into it.—From *The Engineer*, London, August 14.

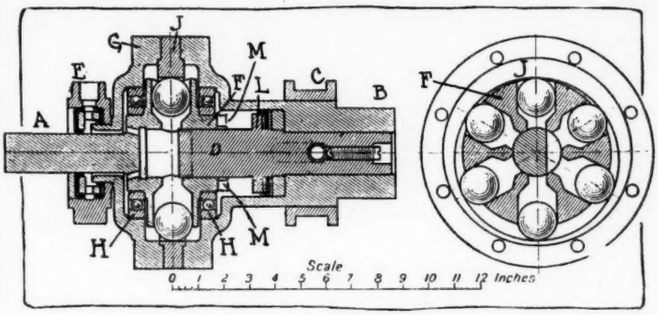


Fig. 2—Carey's hydraulic clutch with balls as pistons

How Low's Small-Size High Compression Motor is Progressing

WITH the economical production methods instituted by the American automobile industry—and now imitated more or less thoroughly in all manufacturing countries—creative engineering, and therefore also designing, is necessarily two or three years in advance of manufacture, being concerned with that which may become embodied in popular motor vehicles two to three years hence. From this viewpoint it is to those constructions and construction features which have not yet reached common acceptance but which nevertheless seem to possess a good fighting chance that most attention is paid in these DIGEST columns, rather than to fully accomplished and recognized improvements. Among the tentative constructions claiming notice the small-size motors designed by Dr. Low of England hold a prominent place because they are operated with very high compression and represent a development promising fuel economies for small and light motors similar to those accomplished with Diesel motors in another field. With regard to the progress made with the Low motors, F. X. Schmelz, a German engineer, writes from London substantially as follows:

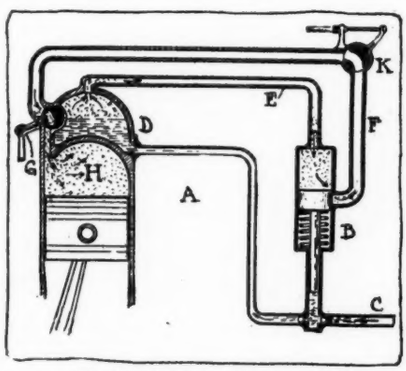


Fig. 3—Scheme of Low motor

The high-pressure motor constructions developed by Dr. Low have passed through the experimental stage and before long [this was written before war began] several models adapted for automobiles, motor trucks and aeroplanes will be placed in the market. The patents have been acquired by a strong syndicate and this is at present working with the inventor on the last refinements intended to make the motors foolproof. A number of well-known English motor firms are also experimenting with these motors and the military authorities are strongly interested in them, mainly with aeroplane service in view.

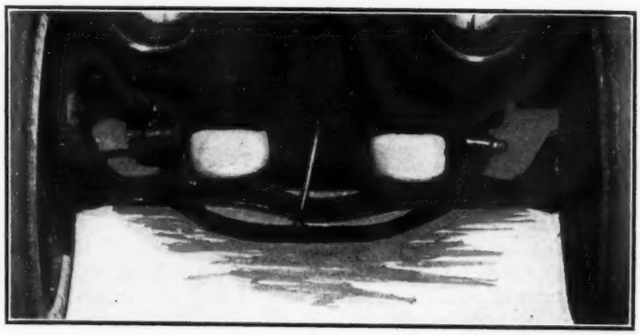
The Low motor now works on the four-cycle system. [An account of the previous stage in its development may be found in THE AUTOMOBILE of March 13, 1913, page 632.] The suction stroke takes in only atmospheric air which is brought to a tension of 35 atmospheres by the compression stroke. This high compression has made the use of a steel sleeve for the cylinders necessary, as with the ordinary cast-iron cylinders the air leaked out through the walls. A still more forcible reason for making the walls absolutely impenetrable is that gasoline vapor under a pressure of 70 atmospheres is stored in a jacket surrounding the cylinder and if this could be forced into the cylinder through its wall an explosion during the compression stroke would be the result.

The accompanying diagrammatic sketch, Fig. 3, indicates clearly how the gasoline is taken into the jacket, how it is vaporized and how it is finally admitted to the cylinder. The jacket is in this sketch represented by the tube A and is connected at one end with a special plunger pump B and with the gasoline tank—by the pipe C—while the other end connects with a dome D over the cylinder head. From the dome a pipe E leads to the space above the piston in the pump barrel. Another pipe F branches from this barrel near the lower end of the plunger stroke and leads by way of throttle K to a valve G giving admission to the combustion chamber H. The starting of the motor is effected with small compression and magneto ignition, as in ordinary motors. The gasoline jacket is filled with gasoline by the first few revolutions and, as the motor has been preheated, this fuel is vaporized and raised to high tension. When this has been accomplished the mechanism is adjusted to produce full compression and thereafter only air is drawn in and compressed. In the first experimental motors the piston at the end of the compression stroke impinged against a needle valve which admitted high-tension vapor to the cylinder, but this arrangement did not admit of speed changes by regulation of the fuel feed, and therefore the rotary valve G was devised which could be regulated mechanically and imparted

(*Continued on page* 459)

Pneumatic Spring Gives Varying Resiliency

Cox Air Cushions Automatically Increase Pressure with Load—Frame Level Constant



Cox pneumatic cushions attached to the front of a car

RESILIENCY that varies with the passenger load is obtained by the pneumatic cushion spring manufactured by the Cox Pneumatic Cushion Co., New York City.

As will be noted in the accompanying illustrations the spring consists of a ball cushion several inches in diameter that is put between the axle and the frame in the place of the ordinary leaf spring. This cushion is connected at its upper end or neck to a large auxiliary tank and when the cushion is compressed, air is transferred from it to the tank. The tank is so large, however, in comparison, that the pressure rise is negligible.

Accommodation to varying loads is automatically obtained by a regulator which changes the pressure in the auxiliary tank and cushion by allowing air to flow from the main tank to the auxiliary tank. The pressure in the main tank is maintained by a pump. The pressure in the auxiliary tank and air cushions varies from about 20 to 30 pounds depending on the load. How the regulator works will be described later but it automatically holds the frame, when the car is at rest, at a certain distance from the ground regardless of the load.

The cushion is made from several layers of rubber and tire fabric and resembles the ordinary tire casing in construction.

The life of these cushions is from 2 to 3 years although in some cases it has been more than this. A leaky cushion is unheard of.

Only the pressure in the rear pair of cushions is varied, the load on the front of the machine being so nearly uniform that the pressure is maintained constant by using a separate tank. That is not connected to the pressure regulator.

Pressure Fixed Before Car Starts

The pressure in the rear cushions is brought to the required amount, before the car starts. But after the machine is in motion the pressure cannot be changed except the small amount due to the compression of the cushions. When the axle is raised on striking a bump, the cubical capacity of the cushion is reduced and some of the air is transferred to the air tank. The walls of the cushion fold back over the conical plungers that support it at the top and bottom, thus increasing the supporting area in accordance with the violence of the shock rendered. Each fraction of an inch of axle movement thus increases the resistance, and the axle, moving upward, gradually slows down and stops.

This is the principle of the pneumatic tire, and, by comparison, the spring and plungers take the place of the road and tread of the tire, the volume of air in the auxiliary tank being more than equal to the volume of air in the tire. This increase of the supporting area of the springs is very much along the same lines as the tire increases its supporting area when it flattens out on the roadbed under an added load or shock. Thus it will be observed that shocks caused by road obstructions are sustained by an automatic increase in the contact area of the springs with the plungers. The auxiliary air reservoir, owing to its large volume of air, relative to the small amount of air displaced from the springs, obviates any perceptible increase in the air pressure while the vehicle is running, thereby allowing a long travel of the plungers into the spring cushion.

Pressure is increased according to the load by means of the regulator, already mentioned, the main part of which is attached to the chassis frame. What is known as the shoe, however, is fastened to the axle. It is the relative movement between these two parts of the regulator that varies the pressure so as to keep the frame level constant.

This shoe is moved out of reach of the rollers when the car is started, by being connected to the change gear lever. If this provision were not made, the relative movement of the axle and frame would cause a transfer of air on a rough road that would prevent the working of the device.

When passengers enter the car, the frame sinks a certain

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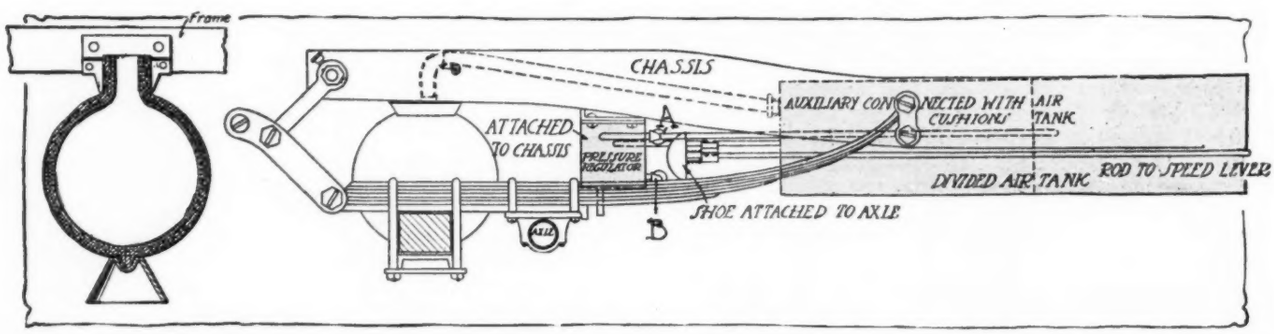


Left—Section through air cushion showing method of attachment and support. From the conical shape of the plungers, it will be noted that when the cushion is compressed, it folds back over these plungers and the effective area is increased.

Right—Cushion attached to rear of car. The spring has been sawed off and a new rear shackle put on. The cushion is placed directly behind the axle. A pipe connects the cushion with the low pressure, or auxiliary side of the air tank. The movement of air from one to the other is free and uninterrupted, when a bump is struck. The right side of the tank contains high-pressure air which is introduced into the auxiliary tank by the regulator when load is put on.

Fremont-Mais Has Double Reduction Axle

Fremont-Mais 1.5-ton truck

Made With Two Frame Lengths— Chassis 1.5-Ton— Flexible Frame and Unit Power Plant

THE new 1.5 ton truck, known as the Fremont-Mais is notable for the flexibility of the frame and of the various power units in relation to it, and for the unit power plant, and double reduction rear axle.

The truck is the design of Albert F. Mais and is manufactured by the Lauth-Juergens Motor Car Co., Fremont, O. It is made in two wheelbase lengths, 132 and 144 inches.

The frame is of pressed steel, substantially straight from end to end, with integral spring horns in front. It is designed to carry but few cross-members, these being designed with integral gussets.

The power plant is placed well forward under a blocky hood, with the radiator in front. It consists of a Buda truck type motor, 3¾ by 5½, fitted with Eisemann fixed-spark ignition and pump cooling; a Warner leather-faced cone clutch, and a Warner three-speed selective gearset, all three being rigidly secured to one another and suspended from the frame at three points. From the gearset the power is transmitted to the rear axle through a shaft with two universals.

Internal Gear Drive Used

The rear system consists of a specially-designed internal-gear-driven rear axle, the axle proper being an I-beam which carries the brake flanges. Bolted rigidly to this is the jack-shaft, consisting of a bevel-driven differential driving spur pinions in each brake flange. The third member enters the differential housing through a bearing in the axle web. In the brake drums are internal teeth which mesh with the spur pinions, thus taking the drive through a secondary reduction. The spring pads are of liberal size and integral with the axle beam, the springs being relied upon to take both torque and propulsion.

Foot brakes are located in the rear drums, the hand brake being on the driving shaft, just in front of the axle. The brake and gearshift levers are both in the center, the steering wheel being located to the left. Although the spark advance is fixed, there are two levers on the steering wheel, one for the throttle and the other for the air adjustment of the carbureter.

A storage battery provides current for the electric side and tail lights. The wheels are of the square-spoked pattern, having 36 by 3½ front tires and 36 by 5 in the rear.

Pneumatic Spring Gives Varying Resiliency

(*Continued from page* 454)

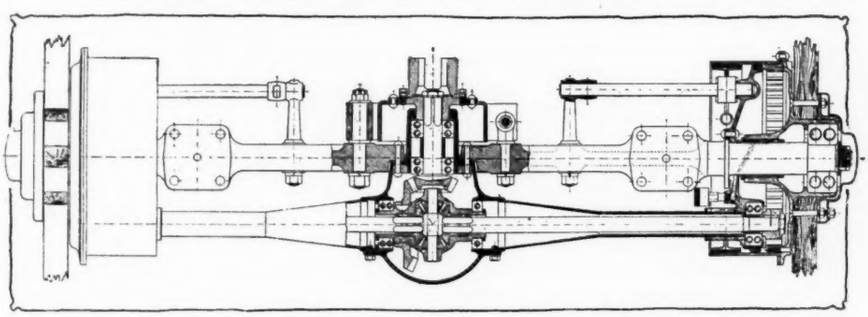
amount, which brings the shoe, which is attached to the axle and moves with it, into contact with the roller A. This action opens a valve between the pressure tank and the auxiliary tank. Pressure flows from the former to the latter, until there is sufficient in the system to bring the frame up to the normal level, when the roller moves out of contact with the shoe and the pressure is shut off. Similarly, if a passenger gets out of the car, the frame will rise and the shoe will press against the roller B, and open a valve that allows the pressure in the auxiliary tank to flow into the atmosphere.

The system may be applied to any car by cutting off the rear ends of the rear springs and putting in a shackle with a double joint in it, thus allowing free vertical movement but no lateral. At the front, all the leaves but two are removed, these being merely to hold the car against side sway. Thus the spring is used as a guiding member. On new cars a solid bar would replace the spring.

A representative of THE AUTOMOBILE had a ride in a touring car equipped with these springs and found that the car rode smoothly on cobblestones at all speeds.

It is claimed that as much as 18,000 miles can be obtained from a set of pneumatic tires due to the superior resilience of these springs.

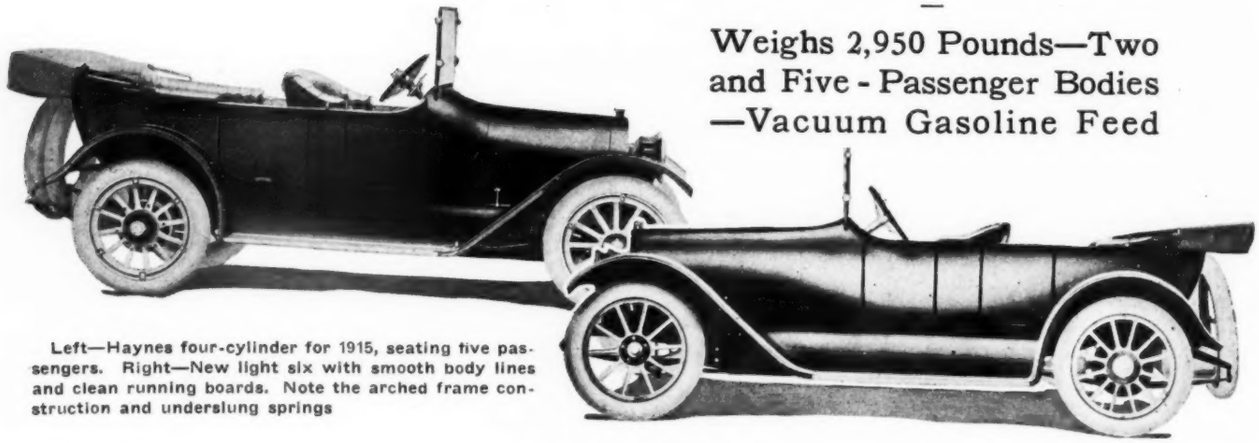
A prominent concern in New York that has a great many trucks, has been using this spring on one of its trucks for over 2 years, and greatly increased tire mileage and reduced wear and tear on the machinery have resulted.



Floating rear axle of the double reduction type used on the new Fremont-Mais truck. The second reduction is in the shape of a driving pinion and internal gear at the wheels. The load is carried on an I-beam axle and the differential gearing and driving shafts are in a separate housing at the rear. Note that the hand brake is located directly in front of the I-beam axle. It is a contracting band type, while the foot brakes expand in drums attached to the wheels.

New Haynes Six Sells for $1,485

Weighs 2,950 Pounds—Two and Five-Passenger Bodies —Vacuum Gasoline Feed



Left—Haynes four-cylinder for 1915, seating five passengers. Right—New light six with smooth body lines and clean running boards. Note the arched frame construction and underslung springs

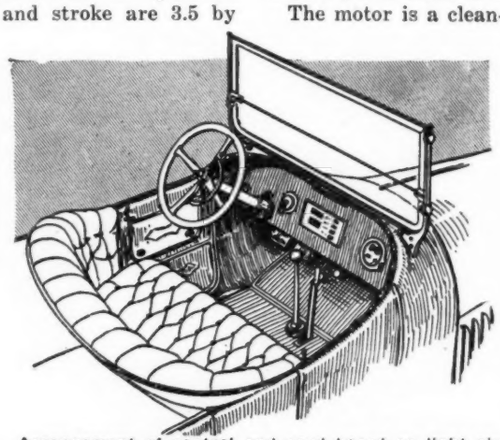
FOR 1915 the feature of the Haynes line will be a new model light six of 55 horsepower, weighing 2,950 pounds, and selling for $1,485, fully equipped. The wheelbase is 121 inches. It will be furnished in both two and five-passenger body styles, and will have left drive and center control. The vacuum system of gasoline feed has been adopted, but the electric method of gearshifting will not be used on this model. A unit power plant with the cylinders cast in a block is used. The bore and stroke are 3.5 by 5 inches.

In addition, the Haynes Automobile Co., Kokomo, Ind., is offering a big six rated at 65 horsepower and selling for $2,250, and a four developing 48 horsepower and selling for $1,660. The electric gearshift will be fitted to these two models at an additional price.

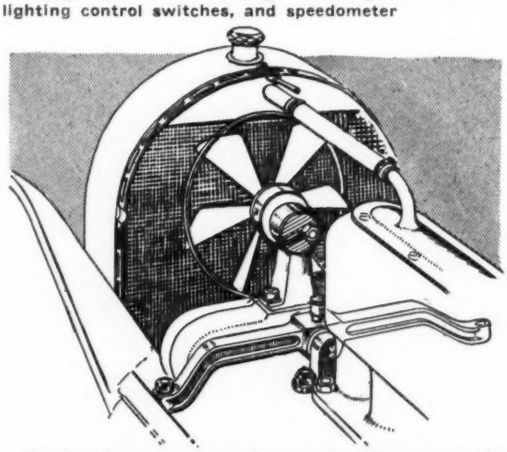
Light Six Entirely New

There are many features of interest in the new six, which is an entirely new job from headlights to spare tire. Smooth body lines are noticeable. The radiator has rounding edges, and the hood tapers slightly to the cowl, where the slant almost imperceptibly increases until the windshield and door panels are reached. The sides of the body sweep down gracefully from the foot of the windshield, the sides being practically horizontal from the center of the front door to the rear of the car. A modern feature is seen in the absence of upholstery on the top edges of the body sides, these being topped off by strips of polished wood. A rakish appearance is produced by the long, straight body lines and the low suspension that is obtained by slinging the springs under the axles.

Unusually complete equipment is a feature. This comprises a motor-driven tire pump, Firestone demountable rims, including one extra rim, and the tire carrier already mentioned. A ventilating clear and rain-vision windshield built into the cowl is part of the outfit, as well as a one-man top, with a Neverleak cover and Collins quick-adjusting curtains. There is an electric horn under the hood, operated by a button on the steering wheel. The headlights are provided with a dimming attachment for city driving. Robe and foot rails are found in the tonneau, and there is a full tool equipment.



Arrangement of control and cowl board on light six showing the flush mounting of the ignition switch, lighting control switches, and speedometer



Front motor support and fan construction on new six. It will be noted that the front of the motor is hung at just one point. The fan is adjusted by the eccentric bushing shown

The motor is a clean-cut design, rigid and compact in construction. The valves are inclosed. Cooling is by means of a cellular radiator, pressed steel fan and large centrifugal water pump. Lubrication is supplied by a combination splash and force-feed system. A plunger pump circulates oil through the motor at the rate of one-half gallon per minute. The connecting-rod dip pins splash the oil from the troughs, which are filled by the pump.

A Rayfield carbureter with hot-air connection to the exhaust pipe is employed, and the intake manifold is cast integrally with the cylinders, so that, not only is the exterior of the motor simplified, but carburetion is aided by the heating of the charge in the inclosed manifold.

Carbureter Under Constant Pressure

The carbureter is fed directly by gravity from an auxiliary tank situated on the dash. Fuel is automatically drawn into this tank from the main tank in the rear by means of the suction of the motor, the auxiliary tank being connected to the manifold by means of a small pipe. Since the amount of fuel in the tank is always the same, the gasoline is fed to the carbureter at a uniform pressure, whether the car is moving along the level, up or down hill.

Separate units, of Leece-Neville make, are used for starting and

lighting. Both are dust-proof. Ignition is supplied from the main storage battery through a Remy combination circuit breaker and distributer. The intensity of the spark is independent of the speed, and this is a great advantage in starting.

From the motor the power is transmitted through a positive three-plate, dry-disk clutch which is lined with Raybestos. It is mounted on ball bearings, is completely incased, yet is easily adjusted from the outside. It is smooth and effective and easy to operate.

The gearset is a three-speed, selective sliding type. The gears are manufactured from drop-forged Samson steel, heat treated, while the shafts are also made of this material, and are mounted on imported ball bearings of ample proportions.

Semi-elliptic springs are used all around. They are made of high-quality spring steel, oil tempered. The front springs are 38 inches long by 2 inches wide, and the rear 54 by 2 inches.

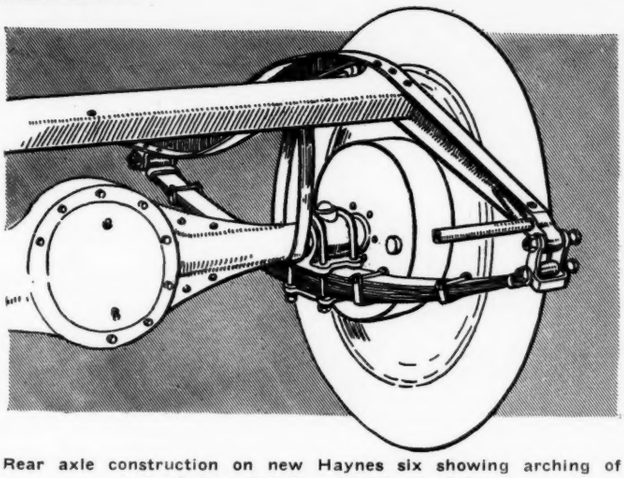
The rear axle is a special Haynes floating type. Unusually large bearings are used throughout, it is stated. Nickel steel is used as a gear material, and the double internal brakes are 14 inches in diameter.

The rear end of the Haynes light six frame is arched in order that an extremely long semi-elliptic spring may be used. Such a construction gives a number of distinct advantages. The length of these springs is 54 inches, giving a very easy riding car.

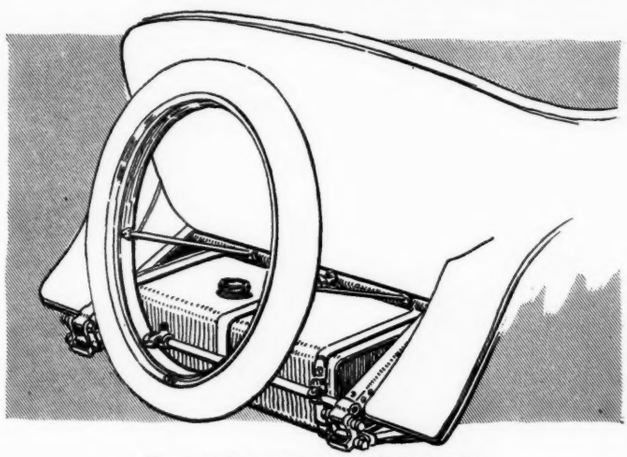
The gasoline tank is carried between the frame members in the rear, and directly back of it is the carrier for spare tires.

Left drive with center control has been adopted, and all the instruments are neatly arranged on the cowl board and within easy reach of the driver.

The light six is known as model 30. In addition, there will be the big six, developing 65 brake horsepower and selling for $2,250. This car is known as model 31 and has a wheelbase of 130 inches. Model 32 is the designation of the Haynes four, which gives a maximum of 48 horsepower, has a wheelbase of 118 inches and sells for $1,660. Closed bodies are built on these two chassis. The big six is furnished with a seven-passenger limousine, selling at $3,650 and with a four-passenger coupe at $3,000. A coupe body seating four passengers is fitted to the four. This sells for $2,500.



Rear axle construction on new Haynes six showing arching of the frame and the underslung spring



Tire carrier used on the Haynes six

Russia—An Opportunity

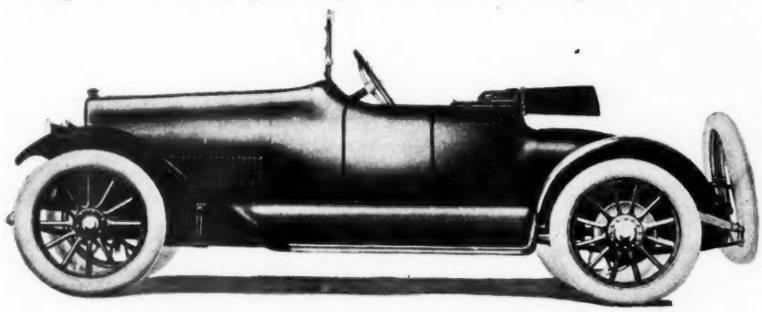
(*Continued from page* 445)

prise rests upon the treatment given to its customers. A poor shop could not exist in Russia, because no high-grade machine will be left for repairs there and no fortune can be made by repairing cheaply the cheap machines only. In reliable places the charges are quite high, considering the average wages paid to the workingmen, but they are lower than in the United States, being about 40 cents an hour. In a few instances the agencies have no repair shop in the true sense of this word, because they try to get along by making the necessary quick repairs and sometimes quite complicated replacements, such as changing crankshafts, right in the yard of their location, under the open sky. An arrangement like that is feasible only with the cheapest cars, when the customers are not very exacting, and it is explained by the difficulty to get a space for a suitable showroom and garage with shop in connection with it. The available places in old houses are not arranged for that, and one has to build to obtain it. Naturally, then, one tries to do the work in the open, when a customer drives up for a short job on his car. As in this country, the general garage business is frequently associated with the renting of cars, sometimes as a taxicab company. The owner is almost always obliged to rent space for his car in a public garage, as the living houses do not offer any accommodations for them, except when specially so arranged by the owner himself. Rent is about $8 per month and as one has a chauffeur, no inconvenience is felt from having the cars housed at some distance from one's residence.

Personal element of the dealer naturally plays a great role in the matter of sales. It is remarkable how in Russia certain makes of cars are distributed in sections, one being the biggest seller in Moscow, another one in Kief (Kiev), being machines of equal standing.

Some cars have changed representatives before finding one who is giving satisfaction. The proper selection of agents is obviously very important for the business, and one can name a few makes of cars which did not get due favor at first but which are gradually spreading now chiefly due to the efforts of their present agents.

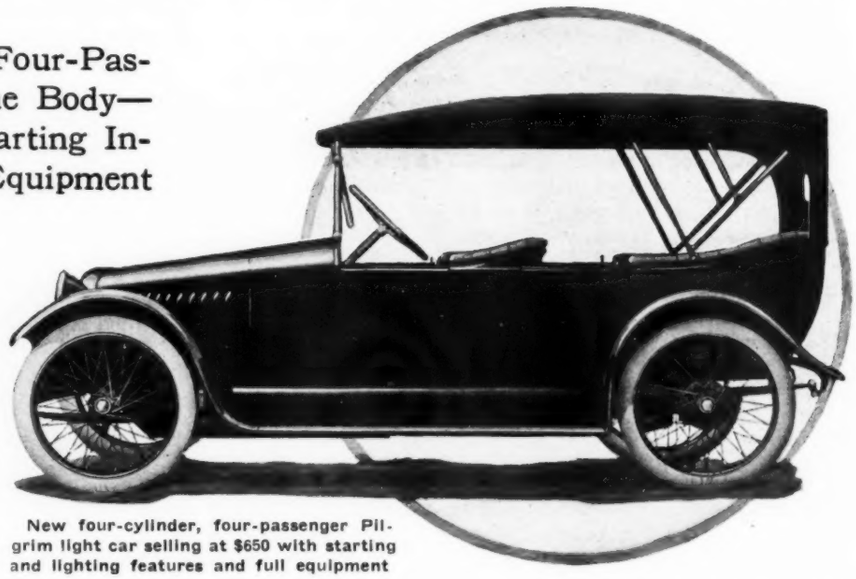
THE END.



New Haynes light six with two-passenger body

Pilgrim Light Car to Sell for $650

New Car Has Four-Passenger Streamline Body—Lighting and Starting Included in Full Equipment



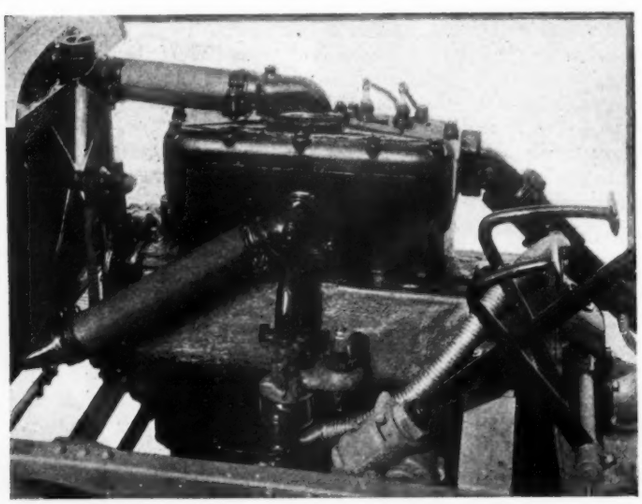
New four-cylinder, four-passenger Pilgrim light car selling at $650 with starting and lighting features and full equipment

DETROIT'S latest light car is the Pilgrim, designed by W. H. Radford, former chief engineer of the Warren Motor Car Co., and previous to that connected with the engineering departments of the Olds Motor Works and the Hudson Motor Car Co. Some time ago it was announced that Mr. Radford was at work upon a light motor vehicle, but THE AUTOMOBILE is now able to give complete details of this machine, which, with full equipment, including lighting and starting features, is to sell for $650 with four-passenger streamline body.

The Pilgrim Motor Car Co., which is laying its plans to manufacture in Detroit, is said to be amply financed by eastern capital, all of which is subscribed, the company being a close corporation. The factory has been located, material contracts are being let and dealers are contracting for territory, according to advices received from the new concern.

Deliveries are to commence on December first, and well-known standard units are incorporated in the design. Mr. Radford has had the first car on the road for some time, having driven it over some 3,000 miles so far.

Though the Pilgrim is a light car and weighs but 1,300 pounds fully equipped, it is amply roomy for four passengers on the wheelbase of 100 inches. Tread is standard at 56 inches, and the body is constructed of sheet steel, has 18-inch doors and 28 inches of leg room in both forward and rear compartments. The fenders, which are domed, conform closely to the wheels and bring the design strictly up to the minute. The fenders and running boards are 9 inches wide, the running board having a length of 57 inches. These parts are made of pressed steel.



Left side of four-cylinder block-cast motor used in new Pilgrim light car. Note the location of the radiator filler cap on water outlet pipe under the hood. Also note hot air intake for carbureter

Wheels are of demountable wire type and carry 30 by 3-inch tires on interchangeable clincher rims. The gasoline tank is also placed in accordance with present-day dictates under the cowl and has a capacity of 8 gallons.

The motor is an efficient appearing four-cylinder water-cooled type of 3⅛ inches bore and 4 inches stroke, block cast, with all valves on the right side and completely inclosed. This cylinder diameter gives the engine a rating of 15.6 horsepower, according to the S. A. E. formula, but it has developed considerably more than that. Valves, of conventional type, are 1⅛ inches in diameter and have adjustable push rods.

The motor does not combine the gearbox in unit with it, but rather that part is combined with the rear axle. At the same time, the power plant is three-point suspended and the flywheel inclosed.

Manifolds are a little out of the ordinary in that the cast exhaust manifold alone occupies the right side, bolting to the cylinder casting and having an opening to each exhaust port, while the intake passages are cored within the cylinder block itself and pass from the opposite side, where the Schebler carbureter is placed with but a single external opening from the casting to the vertical pipe from this carbureter.

The cylinder head is removable and bolts rigidly in place. It goes over the entire top of the casting and when removed exposes valves, water jackets and cylinders. This is a commendable feature of present-day motor design.

The working parts of the motor are all substantially made of conventional type. There are three main crankshaft bearings. These measure 1¾ inches in length for the front end crankpins and 3 inches for the other two. Pistons are each fitted with three rings, and the camshaft has its cams forged integral. Gears at the front end drive it, as well as the lighting generator.

Cooling is by thermo-syphon, employing a 12-inch fan, belt-driven. The radiator is a McCord vertical tube type with horizontal fins. The core has four rows of ¼-inch tubes. Ignition is taken care of by Connecticut distributer in con-

nection with a Willard storage battery rated at 6 volts and 35 amperes.

This battery is also used with the lighting system and for cranking purposes. The Auto-Lite generator, located on the right side of the motor has the ignition distributer in unit with it, and serves for charging the battery. The starting unit has not definitely been decided upon, but it will utilize this same battery current for turning the crankshaft.

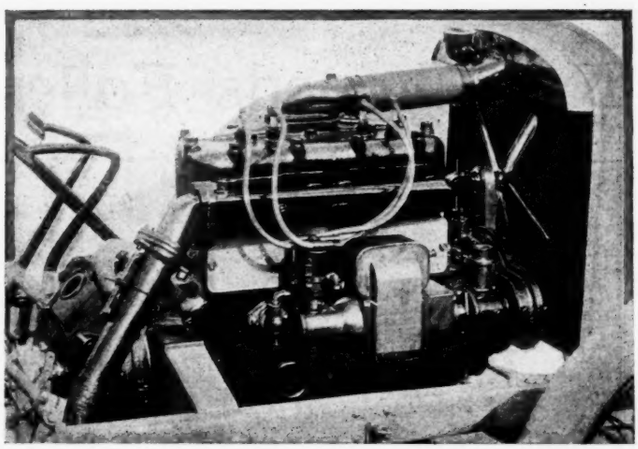
The drive back from the motor is through a cone clutch, leather faced, and a conventional form of driveshaft inclosed with a neatly designed torsion tube which is fitted with a Spicer double universal joint at the front end. In accordance with usual practice when the gearbox forms a unit with the rear axle, this box is inter-positioned between the tube and the axle housing, bolting to each through flange construction. The gearset is of the Northern Engineering Co.'s special design and gives three forward and reverse speeds. It utilizes Hyatt roller bearings, and the drive shaft is four-splined, insuring strength. The countershaft is mounted below the main shaft, and thus gets good lubrication.

The rear axle is semi-floating and has Hyatt bearings also. The drive is through bevel gears with a ratio of 4 to 1, while the propeller shaft and driveshafts are all of chome-nickel steel having a diameter of 1 inch. Due to the torsion tube and its diagonal brace rods all torsional strain and drive strain are carried to the forward cross member of the frame through the yoke at the front end of the tube. The brakes are external and internal, operate on the hubs and use 8-inch drums.

Spring suspension is standard in every way. The 30-inch front half-elliptics are overhung on the axle, as are the 40-inch rear three-quarter elliptics. All leaves have a width of 1½ inches, and, due to their length, these springs should be conducive to very easy riding. The frame is of pressed steel, having a channel 3 inches deep and a 3-inch kick-up at the rear over the axle. The top of the frame is 18 inches from the ground, and there are the usual cross members.

Steering is on the left and control in the center. There are no levers on the wheel, the accelerator pedal being so arranged that it can be either used in a fixed position or as the ordinary accelerator. The spark advance is on the dash. The steering gear is of the worm-and-wheel type, fore and aft, and the wheel has a diameter of 18 inches.

Standard equipment, in addition to that already mentioned, includes one-man top, top envelop, storm curtains, windshield, speedometer and electric horn and tools. The car is really ready for the road when purchased, it is pointed out.



Right side of four-cylinder motor used in Pilgrim light car. Note mounting of starting and lighting unit. Also single exterior manifold, the intake passages being cored within the cylinder block

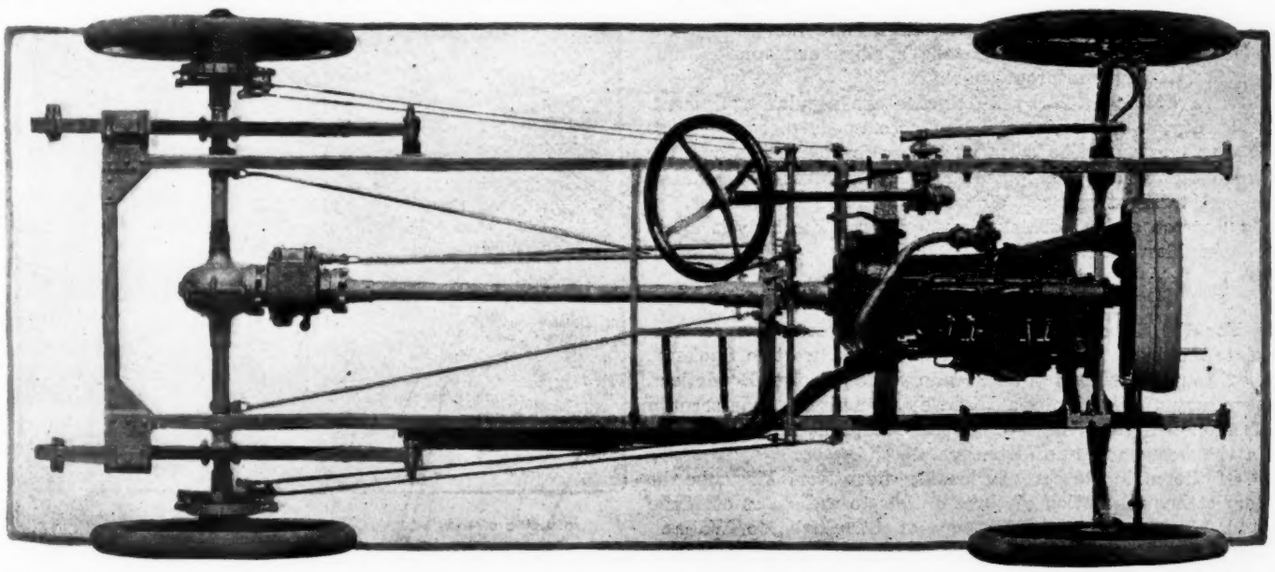
Low's Small High-Pressure Motor

(*Continued from page* 453)

a flexibility to the power output which can be compared only to that of a steam engine. Until lately the design of this valve constituted the principal difficulty in the construction, as it was exposed to very high temperatures. It has now in fact been replaced by a slide valve.

As soon as the motor works with full compression the ignition by magneto might be switched off, but it has been found that the greatest economy and the smoothest operation is secured by introducing the vapor gradually and maintaining the ignition by magneto throughout the explosion stroke. In this manner the expansion curve of a Diesel motor is obtained. Only the combustion chamber is watercooled.

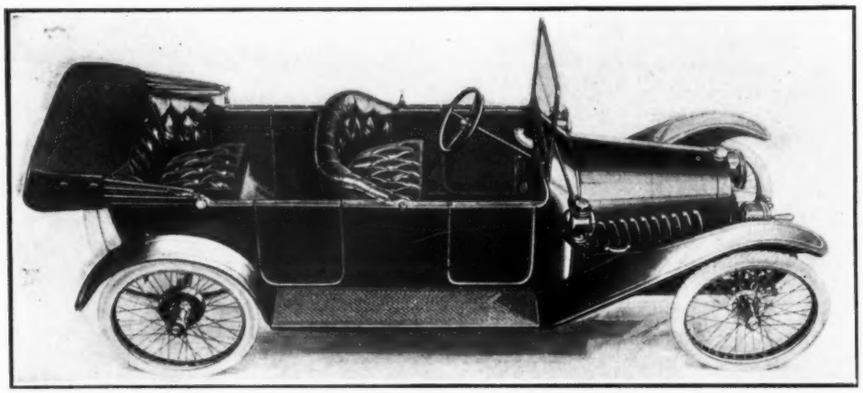
[The report dwells further upon the claimed and very extraordinary economy of the motor and its very high power combined with small weight, but, as the mechanical description remains very fragmentary, all the statements should probably be accepted with much reserve.—ED.]—From *Auto-Technik*, July 4.



Plan view of Pilgrim chassis, showing narrow radiator which leads into the tapering streamline form. Note simplicity of construction

New Woods Follows Big Car Practice

Sells for $380 — Tandem Seating Continued— Streamline Body—Four-Cylinder Motor and Sliding Gearset



New Woods Mobilette showing tapering hood and streamline body

AN entirely new car has been announced by the International Cyclecar and Accessories Company, Chicago, as its product for 1915, this car to be known as the Woods Mobilette, model 3. It is featured by a four-cylinder water-cooled motor, body with tandem seating, 36-in. tread and selective gearset, and its price has been set at $380. The general appearance has been changed so as to make it entirely different, having long running boards, tapering hood, cowl fuel tank, streamline body and as an added feature under-overslung pressed steel frame.

The motor has a bore and stroke of 2½ by 3½ inches and is of L-head construction with the valve mechanism inclosed. The cylinder and upper half of type crankcase are cast as a unit, and the cylinder head is bolted to the top of the casting. The left side of the engine is clean except for the water inlet pipe. On the right side is the magneto, carbureter and oil pump. Cooling is by thermo-syphon system. The engine is suspended by three points from a pressed-steel frame which is of the under-over type. In this the front portion is suspended under the axle and the rear portion over the axle.

From the motor the power is taken by a leather-faced cone clutch with spring inserts and thence by shaft to a two-speed selective gearset incorporated with the rear axle. This is of the floating type. The rear springs are elliptic and underslung, while the front are semi-elliptic and hung above the axle. Propulsion is through the springs and torsion tube which surround the propeller shaft.

Wire wheels of 28 by 2¾ inches are regular equipment. The body is of sheet metal and accommodates two persons sitting tandem. The car's wheelbase is 102 inches and the tread 36 inches. Equipment at $380 includes two side oil lamps, taillight and set of tools, and added equipment, including top and windshield, is $15 extra. The body is interchangeable with a commercial body.

How to Go from Missoula to Spokane

For the information of automobile tourists who contemplate making a trip from Missoula, Mont., west to Spokane, or through Washington and Idaho points, George R. Metlem, secretary of the Montana Highway Commission, has secured the following data regarding road conditions now prevailing in the western part of Montana.

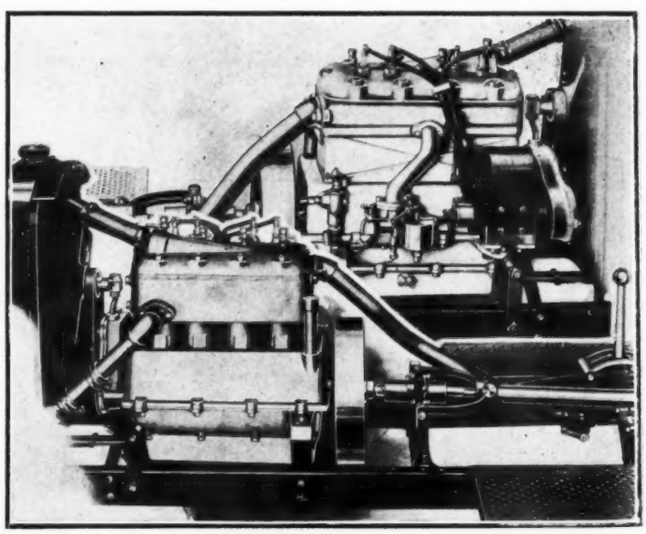
Of the main state roads leading west from Missoula the tourist has the option of three outlets to the states of Idaho and Washington, first, by way of St. Regis, to Wallace, Idaho; second, by way of Ravalli Plains, Thompson Falls to Spokane, Wash.; third, by way of Ravalli, Polson, Kalispell, Libby and Troy to Spokane, Wash.

It is true the grade just west of St. Regis is rather steep, but a new grade is being constructed, the work being in progress at this time, and when completed it will not exceed a 10 per cent. minimum at any place. At present cars that are unable to pull the old grade will be taken over without any charge by the teams working on the new grade.

Tourists taking this route will do well to replenish their gasoline supply at St. Regis in order that they may have a full tank for the grades.

The roads west of Wallace to Spokane, are in good condition. Leaving Missoula on the route by way of Thompson Falls, a good road has been constructed from Missoula to Ravalli and from that point the road leads down to Clark's Fork River. The best road from that point to Spokane follows the line of the Northern Pacific Railway, and is also in splendid condition.

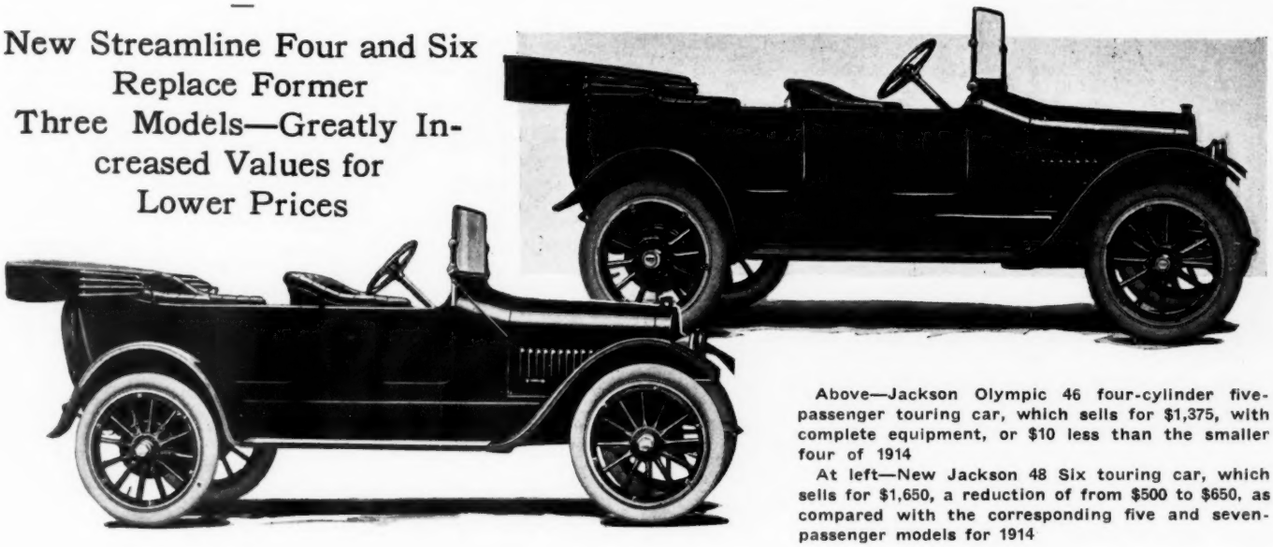
The third route, leaving Missoula west by way of Ravalli over the Flathead Indian reservation to the foot of Flathead Lake at Polson. Here the tourist should take the west side lake shore route via Dayton. This road is open to traffic at all seasons, and leads to Kalispell. From Kalispell west the outlet is over the old line of the Great Northern Railway to Marion and Jennings thence through Kootenai Canyon to Libby.



Two views of new Woods Mobilette motor. At top left is the right side showing the magneto and carbureter mounting, while at the lower right is the left side, showing the water piping and torque tube fastening

Two New Jacksons for 1915

New Streamline Four and Six Replace Former Three Models—Greatly Increased Values for Lower Prices



Above—Jackson Olympic 46 four-cylinder five-passenger touring car, which sells for $1,375, with complete equipment, or $10 less than the smaller four of 1914

At left—New Jackson 48 Six touring car, which sells for $1,650, a reduction of from $500 to $650, as compared with the corresponding five and seven-passenger models for 1914

THE big plant of the Jackson Automobile Co., Jackson, Mich., will be devoted to the production of only two models for 1915, instead of dividing its efforts between three types as in 1914. The new models are, quite naturally, a four and a six, and they are both of the trim, streamline design so much in vogue today.

Last season's Olympic small four, Majestic larger four and Sultanic six have really disappeared, and their places are filled by the 48 Six and the Olympic 46. The latter is mechanically somewhat similar to last year's Majestic, having about the same motor as that model used.

More Value for Less Money

Thus, not only is the four-cylinder Jackson of 1915 a more powerful car than that which carried the name Olympic last year, but it is also offered at a lower price—$1,375 with all equipment, as compared with $1,385 last season. This really is not a fair price comparison, for with nearly the same mechanical chassis features as the larger four of last year and with the same motor, it should be compared with that model in price. On this basis, the reduction has been very great, the 1914 Majestic listing at $1,885. The cut is therefore really $510.

The new Jackson six is also a much less expensive car than was the 1914 six. The price of the 48-Six is $1,650, as compared with the figures of $2,300 and $2,150 asked for the seven and five-passenger models, respectively, last year. This is a reduction of from $500 to $650. The new six is a lighter vehicle than its predecessor, but equally efficient and dependable.

Both Models Are New

Because the two new Jacksons are really not continuations of any previous models, it is hard to draw comparisons with former constructions. Nothing has been neglected to bring the cars up to the latest demands of the motorwise public and in appearance as well as mechanically they are in the front rank. They have the latest of appointments, smooth-sided bodies, clean running boards, hoods sloping gracefully into cowls and sloping bonnets which carry out the general lines.

As compared with the four-cylinder Olympic model of 1914, the new car bearing this title has a longer wheelbase, being increased by 2 inches to 117 inches, while the motor has fully 5 horsepower more, its rating by the maker being about 45 horsepower. This is largely due to the use of the 4½ by 5¼-inch motor in place of the 4⅛ by 4¾-inch type formerly used. The cylinders are cast in pairs and the unit power plant construction of three point suspended type is employed. All valves are on the left and inclosed by cover plates.

334 Cubic Inches Displacement

The cylinder dimensions give a stroke bore ratio of 1.17 to 1, and a displacement of 334 cubic inches. With its bore of 4½ inches, the A. L. A. M. formula accords it a rating of 32.4 horsepower. This naturally falls much below the true power of which the engine is capable.

Working parts are all well designed and aid in this power development. The crankshaft and camshaft, both of which are of drop forged steel, are supported by three main bearings each. Connecting-rods are also steel forgings, while pistons and cylinders are constructed of gray iron. Steel tubing is used for the making of the wristpins within the pistons. Valves are rather large and thus do their part to increase the power, their diameter being 2 1/32 inch. They are of tungsten steel and interchangeable. The pistons have three rings each.

Timing gears, housed at the front, are drop forged steel and iron, this combination being used to make them more silent, as steel running against iron is less noisy than iron against iron or steel against steel. These gears drive the camshaft and magneto shaft in the usual way.

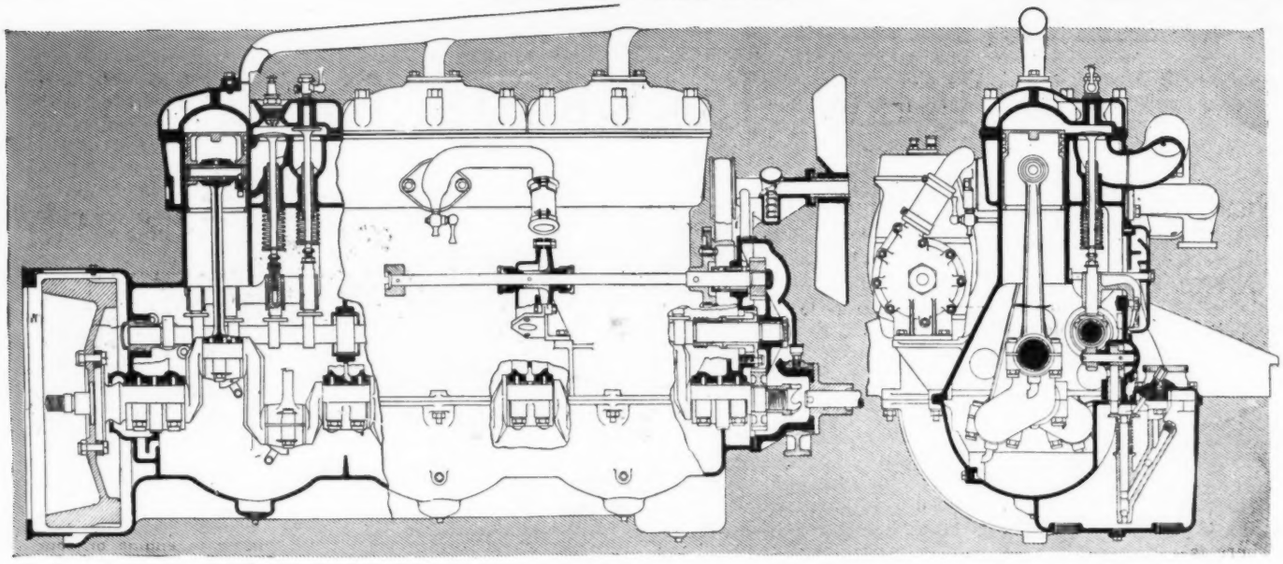
Some of the motor dimensions are given:

Crankshaft { Front bearing—1 7-8 by 3 7-16 inches. Center bearing—2 inches diameter. Rear bearing— 2 1-8 by 4 1-2 inches.

Camshaft { Front bearing—1 by 1 27-32 inch. Center bearing—1 by 2 1-8 inches. Rear bearing—1 by 1 9-15 inch.

Connecting rod bearings—2 by 2 3-4 inches.
Piston pin bearings—1 1-4 by 2 9-16 inches.
Length of pistons—6 1-16 inches.
Length of connecting rods—10 inches.
Valves { Diameter—2 1-32 inches. Length stem guides—3 13-16 inches.

Piston pin bearings are constructed of phosphor bronze



Left—Part sectional view of unit power plant used in the new Jackson 48 Six. Right—Front section through same motor

while connecting-rod and crankshaft bearings are made of die cast babbitt.

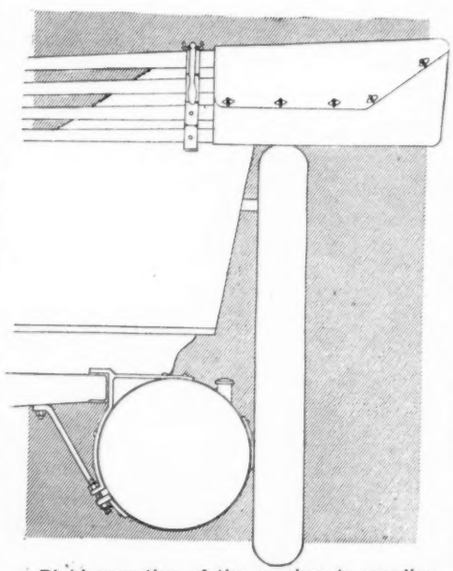
Force-Feed and Splash Oiling

The cooling system of this engine is of the positive type employing a centrifugal pump driven from a shaft on the right side. Back of the pump is the magneto and driven by the same shaft. Oiling is maintained by a force-feed and splash arrangement of conventional form. The oil is pumped from the reservoir at the bottom to the bearings and into the troughs from which it is splashed by the moving rod ends up into the cylinders and to the various other surfaces.

Auto-Lite Electrical System

As heretofore on its four-cylinder cars, the Jackson company uses Auto-Lite cranking and lighting on this car. The cranking motor is mounted in a rather unusual position at the forward end of the engine, as last year, and drives through an inclosed chain and ratchet construction. This electric motor really rests upon its end, its armature shaft being vertical instead of horizontal. The armature shaft carries a spiral gear which drives a sprocket on a countershaft through engagement with a gear on this shaft. The sprocket in turn connects with a sprocket on the crankshaft which sprocket carries one member of a ratchet clutch. When the starting switch is thrown in, the other sprocket member, which slides on the splined starting shaft, is mechanically brought into engagement with the sprocket member of the clutch, and the crankshaft is rotated.

The generator is placed on the right side of the engine on a bracket. It is driven also by a silent chain, and runs at a speed 2.5 times that of the crankshaft. The cranking speed is about 100 revolutions a minute. The system works at 6 volts, and there is a centrifugal governor to prevent overcharging of the battery or too high rate of charge due to high engine speeds. A Willard 120 ampere-hour storage battery placed under the rear floorboards is a part of the electrical system. In connection with the lighting arrangements, a dash lamp has been added, which is a refinement to be appreciated.



Rigid mounting of tire carriers to gasoline tank straps at the bottom and to an iron running within the body piece at the top on the new Jackson cars

Cone Clutch Is Continued

As already brought out, the gearset is an unit with the engine, and gets its power through the intermediary of a leather-faced cone clutch. There are three speeds forward and reverse, and the main shaft and jackshaft are carried on ball bearings. These shafts have a diameter of 1¼ inch.

Back of the gearbox, there is a universal joint, after which the drive shaft enters a torsion tube bolting through a flange construction to the rear axle housing, in accordance with conventional practice for such design. The axle used is a floating type made by Salisbury. It has a pressed steel housing, and Hyatt bearings are used in the differential and wheels. Thrust is taken by ball thrust bearings.

As with other Jackson designs, the new four uses elliptic springs both front and rear. This construction makes very easy riding, it is pointed out.

One change which marks a tendency of the times is the adoption of center gearshaft and emergency brake levers instead of the left position heretofore used. Drive continues on the left.

Although a cowl gasoline tank was incorporated on the fours last year, this has been removed entirely, and a vacuum system with tank at the rear has been adopted. The Webb-Jay type of vacuum device for lifting the gasoline automatically to the tank portion of the outfit on the back of the dash is used. From this small reservoir, it feeds by gravity to the carbureter.

Other minor changes are the adoption of much more rigid tire carriers at the rear which hold the spare casings without vibration. A rigid iron at the top runs through the rear portion of the body to the framework, while the lower supports are attached to the tank.

Tires are 34 by 4 inches, and as an added feature of equipment the rears are of the non-skid variety. A Brewster green finish has been adopted which is very attractive.

A three-passenger roadster is also offered on the four-cylinder chassis at

the same price as that specified for the touring car type.

Although very similar to the four-cylinder Jackson in outward appearance, the new six is somewhat different mechanically. Built upon a wheelbase of 125 inches, this car still has all of the Jackson earmarks, however.

The motor is a 3½ by 5-inch Northway which develops the horsepower indicated by the model designation—48. Due to the small bore, the A. L. A. M. rating is low—29.4—but since the stroke is nearly twice the bore as shown by the ratio of 1.43, this large difference is readily understood. The piston displacement is 288.5 cubic inches.

The design is an L-head unit power plant type with the cylinders cast in one block. Valves are all on the left side, and the upper half of the crankcase is in unit with the cylinder casting, making a compact construction. There are three separate cylinder heads in this engine, each covering two cylinders. When removed these plates or cylinder heads expose the pistons and valve heads which is of great advantage. Heat-treated alloy steel bolts securely fasten the head pieces to the casting proper, and interposed between the two parts is a copper gasket, making a tight joint.

There is no departure from Northway standard design in this power plant. The lower part of the crankcase takes care of the oil reservoir, and at the front the spiral timing gears are completely housed. The centrifugal water pump is driven by shaft on the right side, and back of it is the Delco combination unit which will be spoken of more in detail later. The flywheel is completely inclosed, and at either side of its housing there is a crankcase arm integrally cast for supporting the unit. The front support is at the center of the front end.

Lightweight Reciprocating Parts

The moving parts are all constructed of recognized standard parts. Drop forged connecting-rods, camshafts and crankshafts are made as light as possible consistent with strength and their bearings are all of ample size. The crankshaft and camshaft are each carried on three bearings.

Some of the dimensions follow:

Crankshaft { Front bearing—1 5-8 by 3 7-32 inches.
Center bearing—1 7-8 by 2 19-32 inches.
Rear bearing—1 15-16 by 3 7-16 inches.

Camshaft { Front bearing—1 1-8 by 2 inches.
Center bearing—2 1-8 by 1 inch.
Rear bearing—1 by 1 3-4 inch.

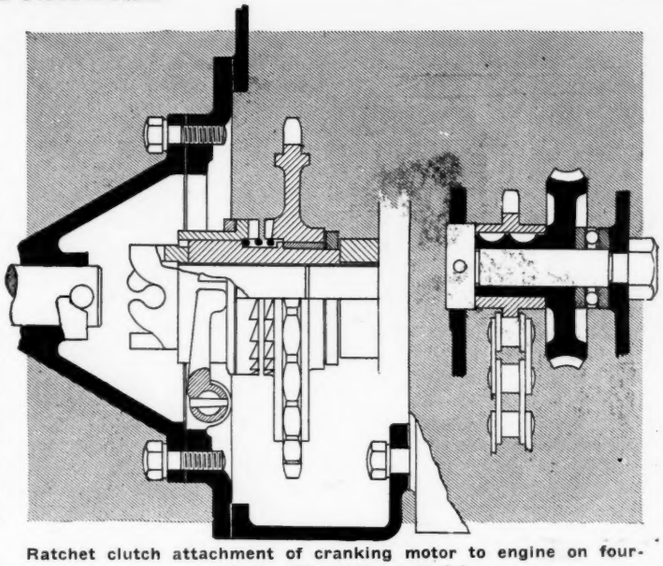
Connecting rod bearing—1 5-8 by 2 1-4 inches.
Piston pin bearing—7-8 by 1 7-8 inch.
Piston length—4 1-2 inches.
Connecting rod length—10 3-8 inches.
Valve diameter—1 23-32 inch.
Valve lift—5-16 inch.
Flywheel diameter—14 inches.

The oiling system of this engine is of the constant level splash type, and the reservoir is located on the left front side of the oil pan. A plunger pump operated by the camshaft pumps the lubricant to the crankcase, after which it runs from trough to trough, and the cylinder walls and other parts get it by the connecting-rod splash.

Delco Motor-Generator Unit

The standard Delco motor-generator unit is employed. This also takes care of the ignition through the use of a distributer. The unit is driven off the end of the pump shaft on the right rear side of the engine. Its gears mesh with those of the flywheel for starting purposes in the usual way, while when these are out of mesh, it drives from the pump shaft as a generator. It uses a Willard storage battery located under the rear floor boards as does the other car, and current from this is sent to the unit for cranking purposes when the motor-generator is temporarily operating as a motor.

Like the four, the new six uses a cone clutch and three speed gearset. The shafts and gears are of alloy steel and



Ratchet clutch attachment of cranking motor to engine on four-cylinder 1915 Jackson model

properly mounted on their bearing. Drive to the rear is through an open propeller shaft which is fitted with two universal joints, one at either end. A torsion member parallels the shaft and takes the drive. The rear axle is also a Salisbury floating type and is fitted with Hyatt roller and annular ball bearings.

Like the four, the spring suspension is characteristically Jackson due to the use of elliptics all around. The frame is dropped to bring the car close to the ground.

Unlike the four, the six has its gasoline tank under the cowl with gravity feed to the carbureter. There is a supply tank at the rear, however.

Tires are 36 by 4 inches and non-skids are used in the rear. Dark blue is the standard body color.

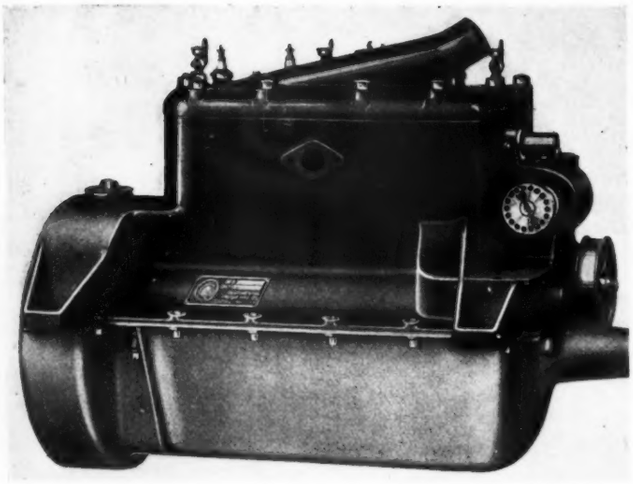
The Call of Mars

(*Continued from page* 437)

Hundreds of military automobiles were to be found on the road to the east of Brussels; these were taking ammunition and food to the main forces. The Belgians have not the same system as the French, and do not possess any subsidized motor lorries, but they have pressed into service every type of car and hundreds of private touring cars are engaged in transporting food. Near Diest and at the village of Haelen the results of actual fighting were to be seen. The previous day the German advance forces had attacked these two places, but had finally been driven off with loss. Dead soldiers were still lying on the roadside and in the fields. A very large number of dead German horses were lying around, many of them disembowled and causing a stench noticeable a mile away. Peasants were digging trenches into which the carcasses were dragged. If the legs protruded they were chopped off; a thin covering of earth was thrown over the dead animals. The village schoolhouse had been transformed into a hospital. As it could not hold all the wounded some of the German soldiers were put on mattresses under trees in the village street and were tended by the peasants.

After a Cavalry Charge

On one of the main, straight granite-paved roads a cavalry charge had been ordered. Belgian troops were in hiding behind the hedges and were fortified at the bottom of the road. At frequent intervals dead horses lay by the roadside, and at the bottom of the road they were piled up in a solid mass. Several of the German officers killed in this fight, and whose bodies still could be seen, had their pockets filled with gold.



Side view of the Continental engine showing carbureter opening

Continental Develops High Speed Motor

New Light Engine Follows Foreign Practice of Long Stroke and High Piston Speed

TO meet the demand for a small, high-speed, small-car motor, the Continental Motor Mfg. Co., Detroit, has lifted the curtain from its newest model which is the result of careful study of conditions both here and abroad.

This new Continental is the smallest motor which has emanated from the plant. The motor, designated Model U, is the same motor as contracted for by Morris-Oxford, Ltd., London, England. This English small car manufacturer placed its contract some months ago. Quantity production will be started the first of the year, and samples supplied in November or December.

It is a unit-power-plant type, adapted for any one of the standard makes of clutch and gearset units on the market. The cylinders, cast in a block, measure 2 3-4 by 4 inches. These dimensions give a S. A. E. horsepower rating of 12.1. On brake test the motor has about shown from 15 to 18 horsepower.

Outwardly the new motor has a distinctive appearance, in that the upper half of the crankcase is integral with the cylinder casting. The cylinder head is removable and is held down by steel bolts and allows for the exposing of all the valves, pistons and cylinders. The other main unit is the lower half of the crankcase which carries the oil pan. The motor is arranged for four-point support, integral arms extending outward for attachment to the side rails of a chassis, being a part of the cylinder block casting.

The valves are on the left together with the exhaust manifold, while the carbureter opening is on the right. A cored passage extends across within the cylinder block to the valve side where the gases are distributed internally to the four cylinders.

The magneto drive is transverse at the front end, there being a spiral gear mechanism driving the cross shaft to which the magneto is attached, it being carried on a bracket cast integrally with the cylinder block. Just ahead of the magneto and its drive, the fan is mounted and is driven by a belt. This arrangement of magneto and carbureter leaves the sides of the motor free from any complications, and accessibility is thereby gained. The lower half of the crankcase carries at its forward end the complete starting crank assembly, including the crank.

Thermo-syphon cooling is employed and in casting the cylinders and crankcase as a unit, the waterjackets are carried the full length of the cylinder bore. Large water connections also do their part.

The lubrication is in accordance with Continental practice, being a combined force feed and splash system whereby the oil pump supplies the individual trough under the cylinder maintaining a constant lever of oil in them. The ends of the connecting-rod dip into these troughs.

The moving parts are all of standard construction and in accord with Continental practice. The pistons have three rings each, and the crankshaft is carried on three bearings and the camshaft on two. The valves have standard form of tappet construction and adjustment.

The weight of the motor including the flywheel and regular equipment is 210 pounds.

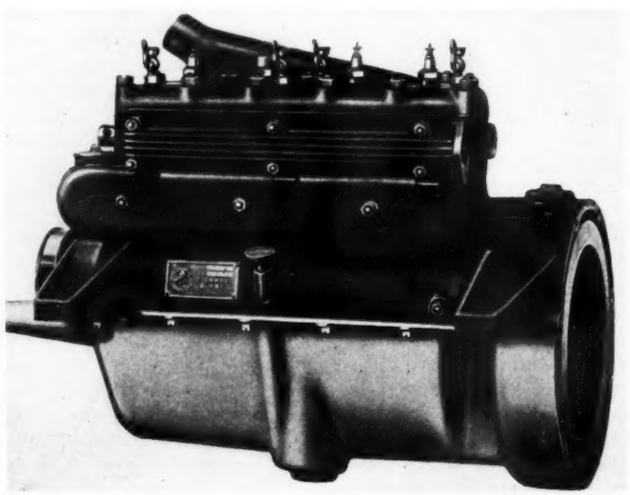
The principal specifications and dimensions are given below. Where two dimensions are given the first refers to the diameter and the second to the length.

	Inches	Millimeters
Camshaft diameter	1	25
Camshaft bearing, front	2x1 3-4	51x44
Camshaft bearing, rear	1 15-16x1 1-2	49x38
Connecting rod, length	7 1-2	191
Connecting rod bearing	1 3-8x1 1-2	35x38
Crankshaft bearing, front	1 1-2x2	38x51
Crankshaft bearing, middle	1 1-2x1 5-8	38x41
Crankshaft bearing, rear	1 1-2x2 7-16	38x62
Crankshaft extension	As ordered	
Piston length	3 1-8	79
Piston pin bearing	.5-8x1 13-32	16x36
Piston rings (three in number), width	3-16	5
Valve diameter	1 1-2	38
Valve stem diameter	3-8	9
Valve lift	.5-16	8
From supporting arm face down to center of crank shaft	1 1-2	38
From center to center of supporting arm bolts	20	508

A. C. A. Increases Its Laboratory Facilities

NEW YORK CITY, Sept. 1—The Automobile Club of America has increased its laboratory facilities considerably by moving the laboratory to a new position in the Club building, offering a greatly increased floor space. In line with the policy of the club to give efficient laboratory service to commercial concerns, a new dynamometer will be installed on which tests on the entire chassis may be carried out. This will be one of the Diehl rear wheel plants, in all probability.

Herbert Chase, who was recently appointed to the position of chief engineer of the club, has organized an efficiency scheme by means of which the cars of the club members are kept up to their highest standard. Mr. Chase's former position of Laboratory Engineer is now filled by Ferdinand Jehle, who was formerly engineer of the Commercial Engineering Laboratory, Detroit, Mich.



Valve side of the new Continental—the intake enters by means of a cored passage across the cylinder

War Should Increase Automobile Exports

Great Demand for Cars Among Warring Nations — South American and Colonial Trades Must Be Supplied by the United States

THE bearing of the war situation on the automobile industry has so many phases that it is impossible to trace the actual result on business as a whole, except to state that, taking the consensus of opinion, it cannot result except for good in this country.

Little is exported from the territory already affected by strife to the United States, and yet the little town of Liége, which was the scene of the first serious clash, is noted for its automobile and accessory productions. Here the Minerva cars and F. N. automobiles and motorcycles are manufactured and here is located the factory of the Englebert tires, one of the makes used to some extent in America.

Liége is but a single example. Throughout the entire country now overrun by the soldiery of Europe are industries closely allied to that of the manufacture of automobiles. The mines and steel works have abandoned their activities, and motor vehicles are being destroyed as rapidly as they were formerly manufactured.

Every Car in Use

The increase in the demand for horses which has always been the natural outcome of previous wars will naturally now be paralleled by the increase in demand for the new method of transportation. This has been demonstrated to the sorrow of many American tourists who found their cars confiscated for war purposes with the small recompense of a scrap of paper signifying that they were to be repaid out of the future war indemnity to be collected by the Government of that particular country should it be victorious.

In a word, Europe is now using every kind of motor vehicle that it can lay its hands upon and is using them in a service far more arduous than that for which they were primarily designed. On one hand, we read of the entire British expeditionary force estimated at 150,000 men transported by motor trucks at rates of speed which outdo the efforts of troop trains. On the other hand, reports reach us of charges by groups of armored motor cars carrying batteries of artillery. The lesson learned in recent maneuvers are now being made use of in actual warfare. Whole batteries of artillery are being towed at speeds averaging in the neighborhood of 20 miles per hour.

American trucks had been looked upon with favor for war purposes in European countries. This is due to the fact that they are of wide tread with good clearance and large wheels, making them adaptable to the worst mountain roads. It is not surprising to learn that one of the Detroit companies has already received a cablegram from one of the European nations now at war, asking how soon the factory could ship 100 motor trucks to its seaports. This is but a forerunner of a practically certain demand, as armies now operate at considerable distances from their bases and a vast supply of vehicles is a necessity.

Export Market Large

It is not alone in Europe that a shortage of cars will make itself felt, but as has been already completely realized by this country, nations to which cars were formerly exported from the Continental and British factories will demand the American product if only through sheer necessity. The passage of the shipping bill will put at the disposal of American manufacturers a greater tonnage than has borne the American flag for many years.

Still another phase which has been mentioned by the sales manager of one of the big production companies is that the cars which are temporarily held here, and that would otherwise be exported, would be of value in meeting the abnormal demands that are always made by dealers in the opening of a new season. Thus, the full attention of the factory can be concentrated on the supplying of the dealers' demands at its heaviest period and then, this demand satisfied, attention can be given to the newly-developed export field.

It is not only in the United States that America's chance to establish her commercial supremacy has been recognized. One of the foremost financial experts of Great Britain prophesies that the war will bring great wealth to American industries and an economic benefit to the people of the United States. He predicts that Americans will be able to sell their goods at prices which will give them a larger income than could possibly be realized had there been no war.

America—the Important Producer

America cannot be criticized ethically for taking advantage of the opportunity presented by the calamity which has befallen a large part of the civilized world. The sympathy of the people of this country has gone out to distressed nations in a way that history has never before recorded. Still, the enormous demand created by the fact that men who formerly gathered the crops of Europe are now shouldering guns in the defense of their countries must be met largely by this country. The United States, as one of the principal grain producing countries in the world, will exchange its products for the gold that Europe has hoarded for its war. The American farmer and the American manufacturer, the producers of the country, will gain, and they in turn, with the enormous purchasing power put into their hands, will carry with them every industry.

History has been made by the motor car in this war. Nothing has had as much to do with the speed of mobilization as the power driven vehicle. Independent of rails and capable of traversing parallel roads simultaneously, immense trains of motor trucks and even passenger cars, were one of the chief factors in making possible the rapid assembly of the huge armies of armed men. Cavalry and motor-towed artillery were the factors that made up the personnel of the almost unbelievably rapid German advance across the difficult country to Brussels. The entire tactics of war have been affected by the possibility of bringing heavy guns to the front almost as rapidly as light scouting parties of cavalry.

Officers have made important use of speedy passenger cars in keeping in touch with headquarters and the motorcycle brigades are recognized as one of the most important branches of scouting service. From the main base to the sub-bases the commissary departments of the various armies are making full use of vehicles that were formerly in commercial service. And even from the sub-bases to the points of distribution along the fighting front, trucks are used wherever the roads render them possible.

THE AUTOMOBILE

PUBLISHED WEEKLY

Vol. XXXI Thursday, September 3, 1914 No. 10

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
231-241 West 39th Street, New York City

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Other Countries in Postal Union, including Canada ---------- One Year, 5.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order, or Register your letter.

Entered at New York, N. Y., as second-class matter.
Member of the Audit Bureau of Circulations
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

War Truck Requirements

INTERCHANGEABILITY is one of the great factors in motor trucks for war purposes on the march, with motor trucks for commissary, for ammunition, for guns and for transporting infantry requires that the trucks used be as standardized and interchangeable as possible. If a front wheel of one is crushed it should be interchangeable with that of another.

Supply parts have to be carried for these trucks, and if two different pieces are carried for two trucks in place of one, the handicap on the army corps is correspondingly more. The French government has required that trucks for subsidy be standard in certain respects, but there is yet much to be done.

Some years ago more or less wonder was expressed at the army requirements that a motor be capable of using three different fuels, gasoline, benzol and alcohol with the same carbureter. The present war, with its shortage of fuel, has demonstrated how essential it is to be able to use one or the other. There are places in the zone of activities where only benzol can be had; at another place alcohol only is available; and at a third gasoline is on hand. It was a wise precaution that made it imperative that a motor be capable of using one or all of these fuels.

The performances of trucks with four-wheel drive is being watched and the reports from the front on the relative performance of trucks using all four wheels as drivers and those driving by the rear wheels only or front wheels only will have an important bearing on the purchases of our war department.

Used Car Standards

SO GREAT is the evil of over-valuing used cars by dealers taking them in trade on new machines that the dealers' association in Chicago is to be congratulated on its initiative in publishing the first volume of Central Market Reports on Used Cars, for the use of its own members as well as for distribution throughout the country.

Dealers from coast to coast have erred in allowing too liberally on old cars in trade deals. In some cases it was because of too great a desire to make a sale, and in other cases it was through ignorance. The Central Market Report should be a great aid. It is a guide to valuation by the dealer on cars other than those he sells. We have our weekly markets on iron and steel; we have our daily stock quotations; we have our markets on scores of commodities, and the institution of a market standard on used cars is but in line with an old-established custom.

How many buyers of iron or steel would think of making a purchase without consulting the market report? How often will a dealer in live stock make sales or purchases without looking over the markets? Then, why should not our motor car dealers be provided with a similar price list? There are many reasons why every dealer should have such a standard of used-car values close at hand. It is impossible for the dealer to carry in mind the actual market value of all makes of cars that he may be called upon to handle in a trade deal. The Central Market Report at once becomes his book of reference in these matters; in fact, it goes further, and becomes his guide.

The fact that the prices quoted in the Central Market Report are based on actual sales lends value to it, and puts it on a par with any other authentic reports. The values published for a certain make of used car are not fictitious but are actual. They give hard facts. They will have the effect of making the dealer conservative.

We should have the Central Market Reports for motor trucks as well as for passenger cars. The evil of over-valuation is present in the truck field as well as in the passenger car trade. Central Market Reports on trucks are needed even more than in passenger cars, because of the greater ignorance among dealers as to the actual selling values of used trucks. Many dealers are new in the truck industry. They have little actual knowledge of used trucks, and are consequently the more in need of some standards of value as furnished in the Central Market Reports. It is to be hoped that soon the price of used trucks will be incorporated in these reports and that the evil of over-valuation will be wiped out before it has done the injury to the truck dealer that it has done to the passenger car dealer.

N. A. C. of C. Holds Optimistic Session

Find That War Slowed Up Industry First 2 Weeks in August But Last 2 Weeks Show Increase of 2,401 Carloads Over 1913 in Car Shipments—Truck Convention Postponed

NEW YORK CITY, Sept. 2—Conservative optimism on the fall trade in automobiles prevailed at the directors' meeting of the National Automobile Chamber of Commerce, representing ninety-three automobile manufacturers at the New York headquarters yesterday. The European war resulted in an almost complete shut down of the automobile trade during the first 2 weeks in August, but reports received yesterday show that a reaction has taken place and shipments for the last 2 weeks were far ahead of the same period last year. It is believed that the trade this fall will be almost up to expectations.

Increase in Shipments Over 1913

The Traffic Department figures showed that during August, 1913, the automobile industry shipped 4,469 carloads, while last month the shipments were 6,870 carloads, most of which were made during the last 2 weeks of the month.

It was decided that the present was an inopportune time for a convention of commercial vehicle manufacturers and a date for holding one will probably be decided upon for late in the year.

There was a most interesting report from the Patents Committee relative to the automobile patent situation and also in regard to the proposed changes in the patent laws at Washington.

Resolution on Accessory Makers' Suits

The directors adopted a resolution expressing their disapproval of various accessory manufacturers having controversies among themselves on patent rights, bringing suits against the makers of motor cars. The resolution is as follows:

WHEREAS members of the National Automobile Chamber of Commerce have been annoyed and embarrassed by threats of patent infringement and by patent infringement suits brought against them or against their customers and users of their cars by certain manufacturers of automobile accessories and parts; and

WHEREAS it is unnecessary for such manufacturers of accessories and parts to bring suits against automobile manufacturers, vendors and users of motor cars in order to assert their rights under their patents, inasmuch as such manufacturers of accessories and parts have ample recourse against the infringing manufacturers of such accessories and parts;

THEREFORE, BE IT RESOLVED that the directors of the National Automobile Chamber of Commerce regard any such suits by accessory and parts manufacturers against motor car manufacturers, vendors or users of motor cars as being unwarranted, unfriendly and against the best interests of the industry; and be it further resolved that the Motor and Accessory Manufacturers Assn. be advised of the attitude of this Chamber on this subject with the end in view of giving all manufacturers of accessories and parts due notice of the attitude and feeling of the National Automobile Chamber of Commerce.

—

To Make Pope Car Parts in Hartford

HARTFORD, CONN., Sept. 2—*Special Telegram*—Announcement is made today of continuation of the manufacture of parts for Pope-Hartford passenger cars, trucks and fire apparatus to be conducted here. The purchase of this business in its entirety by the Pope-Hartford Co., of Connecticut, the new corporation, includes all the parts finished and in process, tools, jigs, fixtures, patterns, drawings, tracings, formulas, and everything pertaining to this important branch of the business. The repair and service department formerly operated by the Pope company will also be continued by the new company at the main works on Capitol avenue. This department will be manned by experts selected from the best men in the employ of the Pope Mfg. Co.

The Pope-Hartford Co. of Connecticut is composed of men who have been connected with the design, manufacture and sale of these cars since the production of the first model in 1902. The officers of the new company are: Wilbur C. Walker, president; Ralph A. Barkman, vice-president; Charles E. Walker, treasurer, and Joseph A. Taylor, secretary. The capital stock authorized is $200,000, divided into 200 shares, par value, $100. There is $60,000 of preferred stock and $140,000 of common stock. The amount of capital stock with which the corporation intends to begin business is $10,000. The incorporators are: W. C. Walker, Charles E. Walker, of Hartford and Ralph A. Barkman, of West Hartford.

To Handle Dodge Cars

The Hartford Motor Car Co. of Hartford, has filed a certificate of incorporation. It proposes buying, selling, and dealing in motor vehicles. The company is the Dodge representative in this section. The capital stock authorized is $50,000 divided into 500 shares, par value $100. The amount of capital stock with which the corporation intends to begin business is $10,000. The incorporators are: Frank M. Ridder, W. C. Walker, Charles E. Walker, of Hartford and Ralph A. Barkman, of West Hartford.

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To Test Washington Anti-Glare Regulation

WASHINGTON, D. C., Aug. 22—New traffic regulations affecting motor car drivers went into effect here this week and met with general approval with the exception of the provision prohibiting the use of brilliant headlights with reflectors. The authorities hold that cars equipped with headlights with reflectors cannot be used at night unless the glass is covered with paint, cheesecloth or some similar material. The use of dimming apparatus is also declared to be illegal.

A test case was made this week when R. H. Martin, manager of the Buick Motor Co., was arrested for driving a car equipped with electric headlights on which there was a dimmer attachment. He was fined $10 and promptly noted an appeal to the court of appeals. It is expected it will be several months before the case will be reached by the higher court. In the meantime the district commissioners are being flooded with protests against the headlight regulation, the protestants pointing out that lights with dimmer attachment should be allowed. There is a possibility that the commissioners will so amend this regulation as to make the use of such lights legal.

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Combination Rubber Takes Over Keaton Tire

NEW YORK CITY, Aug. 31—The Keaton Tire & Rubber Co. has been taken over by the Combination Rubber Mfg. Co., this city, which will continue the manufacture of special brand tires and tubes, and take over the business in its entirety.

H. A. Forbes, formerly general manager of the Keaton company is now connected with the Combination company as manager of its tire department, and F. C. Braden is now identified with the company as sales manager of the tire department.

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Benham Mfg. Co. Asks for Dissolution

DETROIT, MICH., Sept. 2—*Special Telegram*—A voluntary petition for dissolution has been made by the Benham Mfg. Co., which has been making the Benham six, which was formerly known as the S and M. The petition was made upon the suggestion of the creditors' committee and the Union Trust Co. has been appointed receiver and will decide after verification of the concern's condition and the inventory, what the best policy will be concerning the future of the company. According to the latter's statement, the liabilities amount to $76,889 and the assets to $109,000.

Canada Buys Trucks—17 Go to War Camp

OTTAWA, ONT., Aug. 28—The Militia Department of the Canadian Government has supplied itself with motor trucks with the least possible delay. The government has purchased twenty-five, the idea being to have these trucks, all of 2-ton capacity, accompany the Canadian contingent abroad, there to be utilized for the hauling of supplies and other work which heretofore has been done with horses.

The details of the purchase were handed over to T. A. Russell of the Russell Motor Car Co. of Toronto by the Militia Department. The following well known manufacturers received the orders:

The Russell Motor Car Co., of Toronto, 8; the White Company, 5; The Packard Company, 4; The Gramm, Walkerville, 4; and the Reo, 4—twenty-five in all.

A stipulation of the orders was quick delivery, and how soon this was accomplished is illustrated in at least one instance. The White Company received its orders on Sunday, the 15th, and at 2:30 o'clock on the following Tuesday, the 17th, these five motor trucks were in Canada and on their way to Val Cartier where its troops are mobilizing.

Cars, Trucks and Accessories Contraband

NEW YORK CITY, Sept. 1—At a meeting of the New York Chamber of Commerce held last week a statement of information to shippers was adopted. This is of interest in view of the fact that motor vehicles, gasoline and lubricating oil have been declared contraband of war. The report states, that goods shipped to a neutral destination are exempt from capture whether carried in an American, neutral or belligerent bottom. The only exception to this rule is when goods, though shipped to a neutral port, are intended for a re-shipment to some point in the territory of the nations at war. The burden of the proof is then on the captor who must show beyond reasonable doubt that such re-shipment was intended.

The report further takes up the question of ordinary marine and war insurance, the difference between the two classes of contraband and upon what points the capture may be justified. A copy of this statement may be procured by addressing the committee on problems of foreign shipments, during the war, in care of the New York Chamber of Commerce.

Bosch Unaffected by War in Europe

LONDON, ENG., Aug. 31.—*Special Cable*—Editor THE AUTOMOBILE—The Bosch Magneto Co. informs me that it has supplies of magnetos available for all possible requirements. The plant is available if necessary for production. The general state of trade in this country is as reported in THE AUTOMOBILE for August 30.—J. S. Critchley, president of the Institution of Automobile Engineers.

Krit Has New Model for $850

DETROIT, MICH., Sept. 1—*Special Telegram*—To meet the demand for a lower priced car, the Krit Motor Car Co., Detroit, will bring out another model to sell at $850 with electric cranking and lighting.

This new Krit, designated as model O, has the same motor and chassis as the models selling at $995, but it is less of a de luxe proposition, though it is just as good from the standpoint of service. The motor has a bore of 3¼ inches and a stroke of 4 inches, and is an L-head type with block cylinders.

Though the body is a streamline type, it is not so refined; it has the familiar panèled edges which are absent on the other car and is a strictly manufacturer proposition.

To illustrate the equipment differences making possible this lowering in price as compared with the other Krit, the top is not of the one-man type, though it is of a good grade of mohair; there is no gasoline tank gauge; the fenders are not crowned, though preserving the popular curve. The Bosch magneto is not fitted, the new Disco combination electrical system taking care of ignition as well as lighting and cranking. A Schebler carbureter will probably be used.

Though not so refined as its running mate, it is pointed out that this Model O Krit is very good value, for it possesses many high-priced car features. For instance, there is the coped over radiator, tapered bonnet, left drive, rain-vision and ventilating windshield, leather-covered instrument board, Stewart speedometer, demountable rims, and tire carrier at the rear with the gas tank in the cowl.

It is probable that a large proportion of the Krit factory will be devoted to the making of this model, a schedule of about 6,000 of them being figured on. Due to the low price, this car is to be had only in stock form. No changes will be made in color, equipment or fittings. Both roadster and touring car are offered at $850. Deliveries are underway, the first carload going forward to-day.

Stutz Brings Out New Light Four

INDIANAPOLIS, IND., Aug. 31—A light four runabout selling at $1,450 has been announced for 1915 by the Stutz Motor Car Co. In addition another 1915 model is the Bull Dog which consists of a close-coupled four-passenger tonneau on the standard four-cylinder Bearcat roadster. This car sells for $2,250.

The new light four is standard in every way. It has a four-cylinder L-head block motor, 3.75 by 5 inches, made by the Wisconsin company. A cone clutch and the Stutz gearset and rear axle, combined in one unit, are continued. The wheelbase is 108 inches and 32 by 4-inch tires mounted on wooden wheels are used. The front axle is of Timken make and the springs are semi-elliptic all around. The Remy starting and lighting system has been adopted and carburetion is furnished by a Stromberg carbureter.

Right steering and right control are used, the steering gear being a Gommer. The equipment includes Hartford shock absorbers, Warner speedometer, Baker demountable rims, trunk and tire carrier and the body is ironed for a top.

The Bull Dog model is identical with the present Bearcat with the exception that Bosch ignition is used and the gravity tank has been displaced by a pressure system.

Apperson Light Four and Six Appear

KOKOMO, IND., Sept. 1—Apperson Bros. Automobile Co. has added to its line a light four and a light six streamline model. Both cars will be produced in quantities to sell at popular prices.

The building of these two models is an innovation for this company, for they have devoted years to the production of high-powered cars.

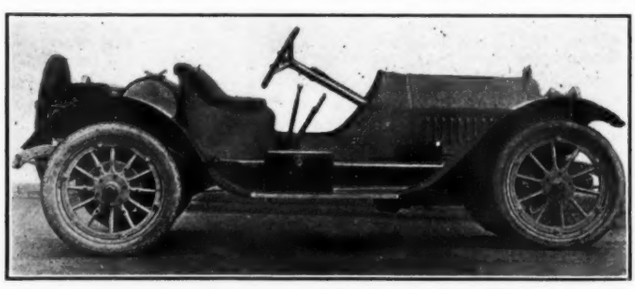
Like all Apperson cars, these two new models were designed by Elmer and Edgar Apperson. The price of the light six is $1,785, with full equipment; and the four is $1,485, fully equipped. The company builds in addition to these cars, other fours and sixes, ranging in price from $1,685 to $2,350.

Trucks Abused by Use of Trailers—C. of C.

NEW YORK CITY, Aug. 28—Inquiries addressed to members of the National Automobile Chamber of Commerce regarding the desirability and economy of using trailers with standard motor trucks have been answered in detail by the following twelve companies:

Avery	Kissel	Speedwell
Baker	Locomobile	Velie
Federal	Packard	Waverley
General Motors	Pierce-Arrow	White

The preponderance of opinion is decidedly against the practice except under very favorable conditions, such as level, smooth, hard roads, slow speed and proper handling. Given such conditions the standard truck may be used successfully for hauling trailers, but under no circumstances should a trailer be used without the consent of the manufacturer, as the guarantee does not contemplate such use. Under any other conditions the practice is of very doubtful economy; therefore truck manufacturers do not encourage the use of



New Stutz light four runabout selling for $1,450

trailers unless they examine the field of operation and know that their trucks can handle the work with trailers under the conditions.

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Low Gear, Non-Stop Test by Franklin Dealers

SYRACUSE, N. Y., Aug. 29—On Thursday, September 24, the Franklin Automobile Co., through its agents, will hold a nation-wide, 100-mile low-gear, non-stop cooling demonstration. The object of this test is to demonstrate the fact that the air cooling system used on the Franklin cars is adequate to take care of the needs of the motor under the most trying circumstances.

The test will be run in about the same manner as the fuel economy test which was made by the Franklin dealers on May 1, 1914, when ninety-four stock Franklin six-30 touring cars averaged 32.8 miles on 1 gallon of gasoline. Every Franklin dealer has been invited to enter the test with a Franklin six-30 car. The run is to be started at 8 a. m. on September 24, regardless of weather conditions and is to be supervised by two or more disinterested observers. The engine is to be kept running throughout the entire demonstration and the cooling system is to be left in its ordinary condition. It is expressly forbidden in the rules that extra oil be supplied either to the motor itself directly, or through the gasoline.

The hood is not to be raised during the run and before starting all the oil is to be drained out, and the fresh oil replacing it is to be carefully measured. The amount remaining in the car is also to be measured after the run to obtain information on the amount used. The number of gallons of gasoline used during the run are also to be measured, and the finish must be within 10 hours of the start.

A complete booklet instructing the agents in the methods of making the test has been issued in order that every agent will carry off the run in a similar manner. In going 100 miles on low gear in 10 hours, each cylinder fires the same number of times as in going 336 miles on high gear. At the conclusion of the run, the time consumed, weather and road conditions, oil and gasoline consumption, will be telegraphed to the company at Syracuse and following this an affidavit will be made out detailing the results of the test.

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Chandler Co. Developing Exports

CLEVELAND, O., Aug. 27.—"We have been shipping cars to countries outside of Europe ever since the war has been in progress," said sales manager C. A. Emise, of the Chandler Motor Car Co. "We are going after the trade in South America, South Africa and Australasia and believe that American manufacturers will in time get the biggest part of the automobile business done in those countries.

"American automobile manufacturers have been getting many automobile supplies and accessories from Europe: for instance, ball bearings, spark plugs, magnetos from Germany; silent chains from England; upholstering material from France; special alloys, steel, windshield glass, etc., from other European countries. The war now gives an unexpected opportunity to American manufacturers to supply some of these materials or supplies and it depends entirely upon them to have the demand become permanent for their goods.

"As far as our own company is concerned, I may say that we have a very large supply of all materials and supplies and accessories of European origin, and are in no way worried. We will make all the cars we have planned for 1915 and we are looking forward to a big business year."

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Chalmers Reduces Light Six Price $200

DETROIT, MICH., Sept. 1—*Special Telegram*—The Chalmers Motor Car Co., Detroit, has reduced the price of its small six-cylinder model from $1,850 to $1,650. This cut of $200 means a sheer reduction of this amount, the car at its new price being identical in every respect as heretofore. This price reduction brings this small six into the price zone of small sixes the public has been observing closely for months past.

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W. R. Chandler Gets Eastern Sparton Territory

NEW YORK CITY, Sept. 1—The Sparks-Withington Co., Jackson, Mich., is greatly increasing the scope of its retail activities. W. R. Chandler has been allotted a large territory in the East, including New York, Pennsylvania, Delaware and the District of Columbia, and has established headquarters in the U. S. Rubber building, Broadway and 58th street.

Big Rubber Stock for Goodyear—Tire Prices Hold

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Some Companies Still Announcing Price Raises —Scarcity of Boats and Tight Exchange Cause Low Imports

NEW YORK CITY, Aug. 31—Tire prices have undergone no material changes this week. The Pennsylvania Tire Co. announced, however, it has increased the price on its vacuum tire 5 per cent. and an increase of 12½ per cent. on its plain tread stands.

Those tire prices which remain the same as before the war are as follows: Kelly-Springfield, Lee, McGraw, Michelin, Overman, Goodyear, Ten Broeck, and Swinehart. The following tire prices are increased: Empire, 12.5 per cent.; Federal, 12 1-2 per cent.; Firestone, 12 1-3 per cent.; Fisk, 15 per cent.; Goodrich and Diamond, 12 1-2 per cent.; Pennsylvania, 12 1-2 per cent.; Republic, 12 1-2 per cent.; United States, 12 1-2 per cent., and the Lee, 12 1-2 per cent.

The Goodyear Tire & Rubber Co. has obtained 1,500,000 pounds of rubber from the London market. This big supply is now nearly all on the way to the factory in Akron. The company has since taken other steps to insure a continuous supply.

The other companies have succeeded in getting a small lot of rubber, but the lack of ocean transportation facilities has greatly hindered them in getting even this small lot.

The demoralization of the foreign exchange market is giving fully as much trouble. As is well known, the principal sources from which crude rubber are obtained are Brazil and the Far East. In both cases the product is paid for through London. Unless the foreign exchange market improves substantially in the near future the buying of crude rubber will be on a reduced scale.

It is expected that 11 of the guayule rubber factories in Mexico will have resumed operations by September 5. Preparations are being made by the Intercontinental Rubber Co., which is composed of Aldrich-Rockefeller interests, to run all of its factories, including the large plant in Torreon, full time. Gangs of men have also been set to work cutting the guayule shrub upon the 2,000,000-acre Cedros hacienda in the State of Zacatecas, that is owned by the company, and a large supply of the raw product will be on hand at the different factories in a short time. It is stated that the recent advance in the price of rubber is stimulating activity in the guayule industry, and that there will be several other large factories established in the Torreon district and in the upper border region of Texas if prices continue high.

Notwithstanding the predictions made in the beginning of this year that, owing to the decrease in prices, crude rubber shipments from the Amazon Valley would show a falling off, variously estimated from 15 per cent. to 25 per cent., it would appear that the amount exported in the crop year of 1914-15 was only slightly less than the average for the last 5 years and but 9.4 per cent. below the record season of 1913-14.

For the crop year ended July 31, 1914, the exports of crude rubber from the Amazon Valley, by port of shipment, were:

Ports	Fine Pounds	Medium Pounds	Coarse Pounds	Caucho Pounds	Total Pounds
From Para to—					
United States...	8,196,315	1,838,690	9,450,145	5,191,535	24,676,685
Europe	15,002,880	1,157,495	1,779,625	4,901,965	22,841,965
From Manaos to—					
United States..	7,769,105	1,559,720	2,503,600	3,366,435	15,198,860
Europe	9,459,815	1,810,785	1,755,420	4,613,575	17,639,595
From Itacoatiara to—					
United States..	16,580	2,030	6,880	13,225	38,715
Europe	182,175	29,305	111,795	52,285	375,560
From Iquitos (Peru) to—					
United States...	219,560	16,020	79,300	707,405	1,022,285
Europe	1,103,750	58,600	373,110	2,315,030	3,850,580
Total to U. S...	16,201,560	3,416,460	12,039,925	9,278,600	40,936,545
Total to Europe.	25,748,620	3,056,275	4,019,950	11,882,855	44,707,700
Gr. total, '13-14.	41,950,180	6,472,735	16,059,875	21,161,455	85,644,245
Gr. total, '12-13.	45,927,905	7,134,340	19,308,010	22,154,810	94,525,065
Gr. total, '11-12.	45,931,105	7,839,635	19,808,530	16,378,140	89,957,410
Gr. total, '10-11.	37,873,210	6,318,450	15,095,050	14,640,895	73,927,605
Gr. total, '09-10.	43,783,800	7,720,585	19,006,050	15,668,250	86,178,685

There is no doubt that if prices continue to rule low it will affect shipments, but for the present at least the output will continue about as given above.

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DETROIT, MICH., Aug. 27—The directors of the Packard Motor Car Co., this city, have declared the regular quarterly dividend of 1¾ per cent. upon the preferred stock, payable on September 15 to the stockholders of record upon the close of business on September 5.

Big Trade Boom in Newark—Business Grows 73 Per Cent.

Cars Selling Under $2,500 Seem the Most Popular in 1914 Sales—Dealers' Reports

NEWARK, N. J., Aug. 29—Never before in their history have the automobile dealers in this city reported such remarkable sales. For the first 7 months of 1914, the average increase in sales is 73 per cent. The cars selling under $2,500 seem to be the most popular.

The Ford company again leads in sales, which number 900, an increase of almost 200 per cent. Philip Plaistridge, the new Ford dealer, expects sales to reach the 1,200 mark this year.

The following is a report in detail:

Velie and Briscoe—Sold seventy-one cars. No increase over 1913. Shipments have been prompt and their delivery immediate. Big 1915 advance in sales. During July and August twenty-eight cars have been sold. The five-passenger touring car is most popular.

Reo—Best year it ever had, with a 300 per cent. increase. Sold 499 cars, including wholesale and retail. Wholesale amounted to 317, its Paterson branch alone selling forty-two. Sold ten cars in last 9 days. Maintains its own service station with a monthly inspection of its customers' cars. Its August business was $9,000 more than the same month in 1913.

White—Reports good business, with a 15 per cent. increase.

Buick—Reports 52 per cent. increase over 1913 sales. The 1915 sales are 50 per cent. better than for the same period in 1913. Predicts the biggest fall business in its history. It is 6 weeks ahead of its factory allotment.

Oakland—Business on a par with 1913. 1915 sales are very promising.

Chalmers—Sales for 1914 were 35 per cent. better than 1913. Expects good 1915 sales. Its allotment is 30 per cent. larger this year.

Mercer and Chandler—Sold 44 cars in 1914 as against 29 for 1913, a 54 per cent. increase.

Pierce-Arrow—This concern did a remarkable business for 1914. Including its service-station work, its special painting department, its second-hand car department and its new car sales, the business amounted to approximately $1,000,000. The second-hand car business amounted to $185,000. Sales for the new series model are 50 per cent. ahead of last year for the same period. Truck business is about 60 per cent. ahead of the preceding year. Thirty per cent. of its passenger cars sales are in closed cars.

Stutz and King—This agency shows a 75 per cent. increase, its sales amounting to sixty-five cars.

National—Sold forty-seven cars in 1914 and thirty-five in 1913, a 34 per cent. increase. Its allotment will be about 40 cars this year. Touring cars are most popular.

Oldsmobile—Has increase of 25 per cent. Will have allotment of 250 of the small-car type and 40 big cars.

Overland—The rush for 1915 cars has brought the agency 3 days behind in its orders. Starting February 1, the sales during the first 5 months of this year have equaled the 12 preceding months. The sales for 1914 are approximately 100.

Locomobile—Sales were on a par with 1913.

Market Reports for the Week

The usual changes occurred in this week's market reports. Rubber rose to $0.77 at a gain of $0.22 over Thursday's quotations. Owing to the smallness of supplies on hand, nominal conditions prevail. It was reported that the London market was firmer for plantations, but no details as to prices were available. Petroleum prices are steady. Quotations on cyanide potash have stopped. An importation, however, was noted of 150 cases of cyanide. Sulphuric acid is steady at $0.90. Both Bessemer and Open-Hearth steels rose to $20.50 at a gain of $0.50 per ton. One interesting development in the steel market was the practical placing of an export order for 2,000 motor trucks and ambulances with an American manufacturer, who is in turn placing contracts for steel shapes to be used in the construction of the various parts. The contract price of the trucks is about $4,000 each, making the total $8,000,000 for the full contract. Copper exports in August amounted to 44,000,000 pounds, while the imports at Atlantic ports is estimated at 22,400,000 pounds.

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Changes
Antimony	.12	.12	.12	.12	.12	.11¾—	.00¼
Beams & Channels, 100 lbs.	1.31	1.31	1.31	1.31	1.31	1.31	.....
Bessemer Steel, ton	20.00	20.50	20.50	20.50	20.50	20.50	+ .50
Copper, Elec., lb.	.12	.12	.12	.12	.12	.12 3/10	+ .00 3/10
Copper, Lake, lb.	.12½	.12½	.12½	.12½	.12½	.12½	.....
Cottonseed Oil, bbl.	7.05	7.10	6.80	6.79	6.80	6.62	— .43
Cyanide Potash, lb.	.25	.25	.25	.25	..	..	.....
Fish Oil, Menhaden, Brown	.40	.40	.40	.40	.40	.40	.....
Gasoline, Auto, bbl.	.13	.13	.13	.13	.13	.13	.....
Lard Oil, prime	.93	.93	.93	.93	.93	.93	.....
Lead, 100 lbs.	3.87½	3.87½	3.87½	3.87½	3.87½	3.87½	.....
Linseed Oil	.60	.60	.60	.60	.60	.60	.....
Open-Hearth Steel, ton	20.00	20.50	20.50	20.50	20.50	20.50	+ .50
Petroleum, bbl., Kans., crude	.75	.75	.75	.75	.75	.75	.....
Petroleum, bbl., Pa., crude	1.45	1.45	1.45	1.45	1.45	1.45	.....
Rapeseed Oil, refined	.82	.82	.82	.82	.82	.82	.....
Rubber, Fine Up-River, Para	.55	.75	.75	.75	.78	.77	+ .22
Sulphuric Acid, 60 Baume	.90	.90	.90	.90	.90	.90	.....
Tin, 100 lb.	39.75	39.75	39.00	39.00	38.50	38.25	—1.50
Tire Scrap	.05	.05	.05	.05	.05	.05	.....

Recent Trade Changes in Newark

NEWARK, N. J., Sept. 1—During the last few weeks, a number of the automobile agencies have made important changes in the way of the addition of new cars or the establishment of new agencies.

L. J. Wyckoff, for many years the Ford agent for this city, has taken on two new cars, the Oldsmobile Four and the Saxon. The taking on of the small Oldsmobile follows somewhat the plan of the New York City Oldsmobile dealer, who has established a number of agencies throughout the city for the small car. The Oldsmobile Co. of New Jersey, 254 Central avenue, will in the near future become the state agency for the Oldsmobile cars. It expects to establish about fifteen small car agencies throughout the state.

Hereafter all sales of Stevens-Duryea cars for this territory will be conducted at the New York City agency, 1875 Broadway. The Newark service station, however, will be maintained.

A $5,000,000 Overland Stock Increase

TOLEDO, O., Aug. 29—The Willys-Overland Co. was authorized on Thursday to increase its capital from $25,000,000 to $30,000,000. Overland officials stated that the increase will be used in declaring stock dividends. The common stock was increased from $20,000,000 to $25,000,000 which, with the $5,000,000 preferred stock outstanding, makes the total $30,000,000. During the present month the company has brought in $250,000 worth of preferred stock for retirement, in accordance with the terms of its charter which specifies that amount to be applied annually in the retirement of preferred stock.

Anderson Electric Conventions in Series

DETROIT, MICH., Aug. 28—Instead of holding one single convention for all their branch managers, dealers, salesmen, etc., the Anderson Electric Car Co., which makes the Detroit electric vehicles, has been holding and will still hold several conventions.

One of the first conventions held was that of factory salesmen. Then there was a convention of branch managers, one of Pacific coast dealers, another of Southern dealers, one of Central West dealers.

At these meetings, which were held at the big plant on Clay and Riopelle, about 160 co-workers of the Anderson company from all over the country have taken part. The 1915 models were thoroughly explained; sales methods and plans for selling campaigns were talked about; there were exchanges of views concerning the second-hand electric vehicle problem and concerning the garage systems and facilities.

"We are now employing 1,200 men," said A. C. Downing of the Anderson company, "and the outlook for 1915 is very satisfactory to us. We are planning to build 30 to 35 per cent. more vehicles than we did this year, the demand all over the country being larger than ever.

"There seems to be a general tendency to help the electric vehicle business as we notice that many other trades or industries or business which heretofore could have assisted the electric vehicle trade in becoming bigger and expanding more rapidly are now coming to the front and helping. Probably the biggest improvement in this connection is the assistance

given by the electric light companies, which are not only giving more favorable rates but are employing electric vehicle experts to give advice to electric vehicle users."

Briscoe Branch in New York—Other Agencies

NEW YORK CITY, Sept. 1—Changes in automobile agencies in the city, either planned or accomplished, are many just now. One of the most important is the opening of the Briscoe Auto Co., of which Rudolph L. De Lisser is the head. This company, a direct representative of the Briscoe factory, will have a store on Broadway just above the northeast corner of 58th street, at 1794 Broadway.

James W. Gilson, advertising manager of the L. P. C. Co., has been here arranging for an agency for the Lewis Six. Another car that will probably be represented by an agent instead of a branch hereafter is the KisselKar. Negotiations are pending with one dealer to take the local retail end. C. H. McCausland will retain charge of the wholesale business of the Atlantic seaboard.

C. B. Derby & Co., local agent for the Abbott-Detroit and Westcott automobiles, has been appointed distributor in Brooklyn for the Oldsmobile. They have established offices and salesrooms at 1270 Bedford ovenue.

The Colt-Stratton Co., eastern distributor of the Cole car, has secured the distribution of the Dodge Bros. car for this territory.

The Greenhut Department Store has taken over the distribution of the Argo car for the Metropolitan district and all surrounding territory, including Long Island, Brooklyn, Staten Island, Westchester County and Fairfield, Conn. This department will be in charge of T. P. Ward. A service department will be installed, near the store, probably next door.

Northwest Dodge Allotment Snapped Up

DETROIT, MICH., Aug. 27—A. C. Templeton, district manager for Dodge Brothers in Minneapolis, Minn., after a 6 weeks' tour through Minnesota, the Dakotas, Nebraska and Wyoming, has returned to Detroit, having closed contracts for 75 per cent. of all the cars which Dodge Brothers have provided for that section of the country. In some parts of the state visited by Mr. Templeton the crops have been much heavier than in any previous year and are also bigger than in other sections of the state, this being due to the fact that blight and the terrific heat has caused some damage to the crops in certain sections.

Splitdorf Charges Patent Infringement

NEW YORK CITY, Aug. 31—The Splitdorf Electrical Co. has brought suit against the Eisemann Magneto Co. charging infringement of patent No. 1,102,385 covering improvements in magneto mounting. The Splitdorf company is the assignee of Ernest W. Brackett, Newark, N. J., and claims that the Eisemann company made or sold or caused to be made or sold in the borough of Manhattan, magneto mountings embodying the invention of the patent. The plaintiff prays for a writ of injunction, as well provisional as permanent, and also for damages and costs of the suit.

The Eisemann Magneto Co. claims that the so-called invention described in the patent was manufactured and marketed by others for some years before the granting of the patent in suit. The Eisemann company will contest the suit on this ground.

Studebaker Demand Biggest in Years

DETROIT, MICH., Aug. 27—According to first vice-president A. R. Erskine of the Studebaker Corp., the demand for Studebaker cars is the heaviest the corporation had in many years and at the present time the concern is more than 3,000 cars behind its schedule of deliveries.

"We are shipping 160 to 180 cars daily and doing our utmost to catch up with this unprecedented situation in our plants," said Mr. Erskine. "Anyone who thinks that the war in Europe will affect to any great extent the automobile business is mistaken. It seems to me from the reports I have received from all over the country that the farmers of the United States will buy more cars than in any previous year, while in most cities and towns the reports from agents, representatives and branches, are the most encouraging and indicate a bigger demand than ever before."

Reorganizes Standard Roller Bearing Co.

PHILADELPHIA, PA., Sept. 1—In conjunction with manufacturing and banking interests in Philadelphia, New York and other Eastern cities in the East, S. S. Eveland, former president of the Standard Roller Bearing Co., which went into the hands of receivers last year, has plans under way for a reorganization of the company.

At the headquarters of the Eveland Engineering & Manufacturing Co., Mr. Eveland could not be seen today, as it was said that he was attending an important conference bearing on the reorganization plan. It was announced, however, that such a plan was nearing completion, but until the preliminaries were cleared up it was not possible to get more than a mere outline of what was to be accomplished.

The only information forthcoming was to the effect that a substantial payment to the creditors' committee had been made to bind the bargain.

It is understood that the plan of reorganization contemplate the payment to the company of a large sum for working capital, and also the payment to creditors of a certain percentage of their claims, including debenture holders, banks and mercantile creditors, the balance to be paid gradually. All stockholders will retain an interest in the concern.

Receiver for American Voiturette Co.

DETROIT, MICH., Sept. 1—*Special Telegram*—The Detroit Trust Co. has been appointed receiver for the American Voiturette Co. of this city, builder of the Car-Nation small car and the Keeton car. H. L. Stanton, who is in charge of the receivership, states that all creditors are being notified by circular letter of the situation and that work will be immediately begun on making inventory and issuing a statement of the assets and liabilities of the concern. The order of the appointment of the receivership was signed by Judge Sessions of Grand Rapids and the receivership is in the United States District court, eastern district of Michigan in equity. The application for the receivership was made by a creditor of the organization.

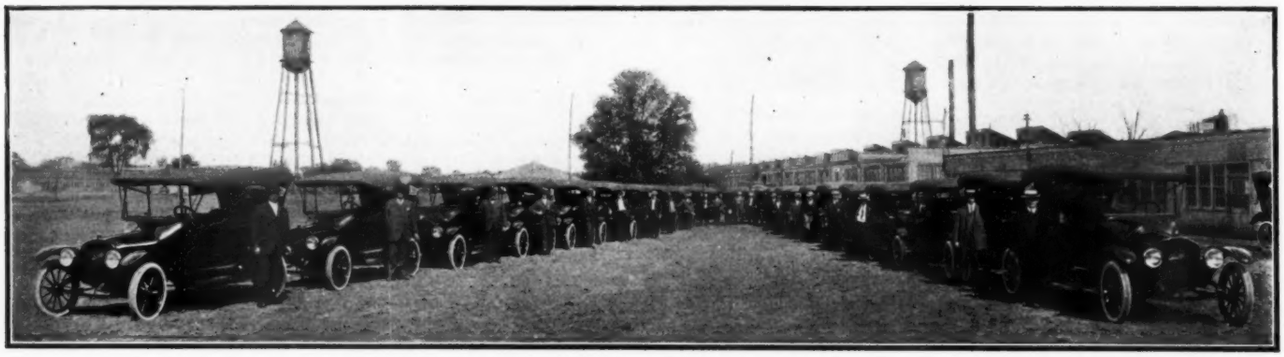
The receiver states that the liabilities according to the company's statement approximate $231,000. No statement of assets is made, but there is material for 600 Car-Nations on hand in construction and material for 100 Keetons. The receiver will carry on manufacture of these parts as soon as the inventory is taken. Since April 1 the company has manufactured 1,200 Car-Nations and has distributed these through more than a dozen centers. A representative of the concern makes the statement that the narrow tread, which has demonstrated its value on all kinds of roads has been generally criticized by all dealers selling standard tread cars.

Hoosier S. A. E. Prepares Winter Program

INDIANAPOLIS, IND., Aug. 29—At a dinner and meeting of the Indiana branch of the Society of Automobile Engineers, at Crows Nest, near Indianapolis, a few days ago, plans for the winter meetings were discussed. One meeting will be held each month and an interesting program of technical papers and other features will be arranged for each meeting. A committee is now at work on a program for the first meeting, which will be held the evening of September 9 at the Claypool Hotel, Indianapolis. Efforts are to be made to increase the membership during the meeting.

BOSTON, MASS., Aug. 31—On motion of the creditors, Judge Dodge in the U. S. District Court today postponed the question of sale of the Walpole Tire & Rubber Co., until October 15.

Third annual outing of the Motor Truck Club, New York City



Twenty-five dealers from western New York State at the Maxwell plant taking delivery on new Maxwells

De Palma Will Drive at Brighton Beach Races

NEW YORK CITY, Aug. 27—The 2-day automobile race meet scheduled for Saturday, September 5 and Labor Day, September 7, at Brighton Beach track, will bring forth a few of the Elgin stars. Ralph De Palma will drive the same Mercedes with which he won the recent two Elgin road races, also the Mercedes with which he captured the last two Vanderbilt cup races and the Elgin road race in 1912. His brother, John De Palma, will drive one of these Mercedes cars in some events and possibly a Peugeot racer in others. Ralph Mulford is at present on his way from Elgin, driving his Peugeot over the roads.

Harry Grant will probably drive a Sunbeam. Jack Le Cain of Boston will drive one of the two Chevrolet specials entered; the other driver is not nominated as yet. Dickinson has entered a Stutz; Strang will drive a 120-horsepower Benz; Vail will be at the wheel of the old Ford 999. Armour Ferguson will probably drive his 160-horsepower Peugeot, while other entries are George Smithson in a Cole, Neil Whalen in the Greasy Bullet, and a Lozier, Fiat, Paige-Detroit, Isotta, National and a Mercer.

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Race Meet at Boston, October 10

BOSTON, MASS., Aug. 31—In connection with the First Annual Light Car and Cyclecar Show to be held at Horticultural Hall, Boston, October 12 to 17, there will be a race meet on Combination Park's 1-mile dirt oval at Medford, Mass., on Saturday afternoon, October 10. The card of events as arranged by manager E. P. Blake calls for a 2-mile Class A race for cars up to 71 cubic inches cylinder displacement, a 5-mile race for Class B cars from 71 to 100 cubic inches cylinder displacement, a 5-mile Class C race for cars from 101 to 125 cubic inches and a 25-mile free for all race for all cars up to 125 cubic inches and 1,150 pounds chassis weight.

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Postpone Wisconsin 3-Day Tour to Sept. 7

MILWAUKEE, WIS., Aug. 31—The fourth annual tour of the Wisconsin State A. A., scheduled for September 2, 3 and 4, has been postponed to September 7, 8 and 9 so that the run may start on Labor Day and contestants will actually spend only 2 working days on the road. When entries closed August 27, there were eight actual entries and five conditional entries, depending upon the arrival of 1915 models. To accommodate the uncertain entrants, the tour was set forward 5 days, and in the meantime additional entries will be solicited.

The cars already officially nominated are: Mitchell, Mitchell Automobile Co., Milwaukee; Franklin, Sanger Automobile Co., Milwaukee; Chevrolet, Olson-Pauly Co., Manitowoc, Wis.; Buick, Buick Motor Co., Milwaukee; Studebaker, Wolleager Automobile Co., Milwaukee; new R. C. H., Creek Motor Sales Co., Milwaukee; White, White Automobile Co., Milwaukee; Oakland, Creek Motor Sales Co.; Reo V, Curtis Automobile Co., Milwaukee; Jeffery 4, Reeke-Osmond Motor Car Co., Milwaukee. These ten cars will be supplemented by at least five others, making an entry list of 15 for the only reliability-economy tour to be run in the United States this year.

The tour will be run under grade 1 rules of the A. A. A., with supplementary rules framed by the W. S. A. A. to cover the economy feature of the run. It will be run in eight divisions, for economy purposes, the classification being according to price, as follows: Up to $450; from $450 to $800; from $800 to $1,200; from $1,200 to $1,600; from $1,600 to $2,000; from $2,000 to $3,000; from $3,000 to $4,000, and over $4,000.

There will be eight trophies, donated by *Wisconsin Motorist*, one for each class in the economy test; the *Milwaukee Sentinel*, $1,000 gold cup as a sweepstakes prize; the *Milwaukee Free Press*, cup for reliability, and the Emil Schandein cup for private owners. The Schandein cup class has already two entries, and officials of the W. S. A. A. say they will be satisfied to have a total list of 5 private owners. The tour will last 3 days and cover approximately 475 miles through the most thickly populated section of Wisconsin.

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Races and Show at Michigan State Fair

DETROIT, MICH., Aug. 31—The chairman of the contest board of the American Automobile Assn. has informed the promoters of the 2-day race meet to be held on the Michigan state fair track September 6 and 7, that the ban upon the track has been lifted for those 2 days. Among the prominent race drivers thus far entered to drive in the races are: Bob Burman, Louis Disbrow, Johnny Rainey, Fred Horey, Charles Coey and Harry Davison.

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Half Fees for Owners Alone in Ohio

COLUMBUS, Aug. 29.—The attorney general of Ohio has handed down an opinion in which he holds that the provision of law for half fees after September 1 refers only to automobile owners and not to chauffeurs, dealers or manufacturers. After that date the fees for egistering gasoline cars will be $2.50; electrics $1.50.

State Registrar Shearer believes there will be 120,000 cars registered in the Buckeye State as the number is now 115,000.

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Amateurs Win from Trade in Chicago Run

CHICAGO, ILL., Aug. 31—The fourth annual team match between amateur and trade members of the Chicago Motor Club for the A. J. Banta trophy took place Friday and Saturday of last week and resulted in a victory for the amateur team by a score of 181 for the victors and 251 for the losers. The trip was to St. Joe, Mich., and return, a journey of about 210 miles. The amateur team was made up of six cars, while the trade team had the same number. On the winning side L. H. Phiffer in a Velie, O. W. Hahn in an Overland and E. Turner in a Mercer made perfect scores. Captain J. Frank Meyer in a Ford drew 178 points, while L. M. Barr in a Peugeot was docked 1. On the losing side the clean scores were made by R. C. Cook in a Stearns-Knight and John D. O'Connor in a Buick. John A. Bell in a White and F. E. Sparks in an Oakland each drew 1 point. B. McSteele in a Scripps-Booth was the chief offender, drawing 222 points the first day.

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Maxwell Dealers from Buffalo Region at Plant

DETROIT, MICH., Aug. 28.—Under the leadership of the Meyer Motor Co., Buffalo, distributor for the Maxwell cars in that city and vicinity, twenty-five dealers and sub-dealers from that territory came to the Maxwell plant this week to take delivery of their 1915 demonstrators. They were entertained by the Maxwell company at luncheon and were shown through the plant and given a talk about the new car and the company's selling campaign. The visitors returned to Buffalo by boat but took their new demonstrators with them and started for their home towns in them.

Factory Miscellany

FORD Employs 9,031 Foreigners—A count was made recently among the workingmen at the Ford Motor Co., Detroit, Mich., to find out how many foreigners were employed and to what nationalities they belong. This resulted in finding that the 9,031 foreign workers belonged to twenty-two different nationalities. The Poles numbered 2,677; then came the Russians, 2,016; Roumanians, 750; Italians, 690; Germans, 606; Austrians, 388; English, 380; Syrians, 330; Hungarians, 269; Canadians, 226; Servians, 210; Irish, 148; Scotch, 133; Lithuanians, 73; French, 55; Hollanders or Dutch, 26; Danes, 21; Croatians, 13; Turks, 8; Belgians, 6; Japanese, 3; Australians, 3. Total, 9,031.

Entire Denby Organization in Plant—The entire organization of the Denby Motor Truck Co., Detroit, Mich., is now located at the plant, Dubois and Franklin streets. The general offices were up to the present in the Dime Bank Bldg.

Robie Co.'s Plant in York—The Robie Motor Car Co., which had temporary quarters with the Massnick-Phipps Mfg. Co., in Detroit, has moved to York, Pa., where it will manufacture a light car. No information has been given by the company, but an announcement is expected to be made within the next few weeks.

Mohawk Rubber's New Plant—A building permit has been granted to the Mohawk Rubber Co., Akron, O., for the construction of a $15,000 addition to its factory on Second avenue and River street. It is planned to construct another building of similar design and size during the Fall. Each of the buildings will be 100 by 61 feet and two stories high.

Wheel Plant for Rockton—The Great Northern Mfg. Co. organized to manufacture a new wheel for motor cars which will do away with the necessity of using pneumatic tires, has decided to build a factory at Rockton, a few miles south of Beloit, in Winnebago County, Ill.

Will Make Ford Tires—A new tire making concern is being organized in Toledo, O., and application for a charter will soon be made to the secretary of state. The concern will take for its name the Ford Tire Co., and will manufacture tires and tubes exclusively for Ford cars. It is said the company will be financed on the co-operative plan by Ford owners.

U. S. Truck Plant in Covington—For the purpose of taking over the United States Motor Truck Co., of Cincinnati, O., a new concern of that name was recently incorporated under the laws of Kentucky with an authorized capitalization of $25,000. The new company has located its plant in Covington, Ky., where it is turning out U. S. trucks in 2, 3 and 4-ton sizes. New 1 1-2-ton models will be announced shortly.

Additional Plant for Ball Bearings—Announcement has been made in Philadelphia that the Hess-Bright Mfg. Co. will add to its plant at Front street and Erie avenue in that city in view of the necessity put upon it by the war of manufacturing in this country ball bearings which have been manufactured heretofore in Germany. It is stated that plans have been made for the necessary additions and work will begin at once. Automatic machinery will be employed to the largest extent possible, the higher wage scale in this country furnishing a greater incentive to the use of such machinery than exists in Germany.

M. & M. Co. Enlarges—To take care of its increasing business the M. & M. Co., Cleveland, O., dealer in automobile supplies, has acquired addiitonal property and will erect a new plant. The M. & M. company of which J. C. McLean is general manager, recently took over the stock and good will of the Kinsey Mfg. Co., Toledo, maker of radiators and parts. This stock will be shipped to Cleveland to be disposed of.

Russell Co. May Add Men—The Russell Motor Car Co., Toronto, Ont., has announced its intention to keep its full staff on its books and is very optimistic regarding the stability of Canadian business. "We are endeavoring to keep every man employed, so that our workmen may not suffer to any considerable extent," said an official of the company, "We have no intention of laying off men or of closing down the works. We feel that Canadians will be fair enough to support a Canadian industry which at a time like this gives support to Canadian workmen." Both in the automobile and bicycle departments of their concern, the Russell company said that there has been no falling off in the number of orders and that they may have to hire additional men instead of discharging any. The company has enough work on hand, declared the official, to keep it busy for several months.

The Automobile Calendar

Sept. 4.....Des Moines, Ia., Track Race, Iowa State Board of Agric.
Sept. 5-7.....Brighton Beach Race Track Meet; Motor Contest Dealers' Assn.
Sept. 6-7.....Detroit, Mich., Track Meet, J. A. Sloan.
Sept. 6-7-8.....Newark, N. J., Cyclecar Reliability Tour to Atlantic City.
Sept. 7.....Brighton Beach, N. Y., Track Meet, New York Motor Dealers' Contest Assn.
Sept.....Denver, Col., Track Race, Overland Park Track, Denver Motor Club.
Sept. 7-14.....Hartford, Conn., Show, Charter Oak Park.
Sept. 7-14.....Indianapolis, Ind., Automobile Show, Indianapolis Automobile Trade Assn.
Sept. 9.....Corona, Cal., Road Race, Corona Auto Assn.
Sept. 9-11.....Convention Paving Brick Mfrs. Assn., Cleveland, O.
Sept. 10.....Portsmouth, Eng., Autumn Conference, Institute of Metals.
Sept. 12.....Hamline, Minn., Track Meet, Minn. State Fair.
Sept. 15-16.....Norfolk, Neb., Track Race, Norfolk Commercial Club.
Sept. 15-Oct. 11...New York City, Commercial Tercentenary Celebration.
Sept. 23-Oct. 3...Oklahoma City, Okla., Show, Oklahoma Automobile Association.
Sept. 26.....Kalamazoo, Mich., 100-Mile Track, Inter-State Fair.
Sept. 27.....Pleasanton, Cal., Track Meet, Alameda County Fair Assn.
Oct. 3-10.....Cincinnati, O., Show.
Oct. 3.....Fresno, Cal., Track Meet, Fresno Co. Agricultural Assn.
Oct. 4.....St. Louis, Mo., Automobile Show, Auto Manufacturers' and Dealers' Assn.
Oct. 5-12.....St. Louis, Mo., Show, Forest Park Highlands.
Oct. 7-17.....New York City Electric Vehicle Show, Grand Central Palace.
Oct. 10.....Medford, Mass., Track for Light Cars, Combination Park.
Oct. 10-17.....Boston, Mass., New England Light Car and Cyclecar Show, Horticultural Hall.
Oct. 17-24.....Pittsburgh, Pa., Automobile Show, Auto Dealers Assn., Inc.
Oct. 17-Nov. 1....Dallas, Tex., Show, State Fair Grounds, Dallas Automobile Dealers' Assn.
Oct. 19, 20, 21....Philadelphia, Pa., Elec. Veh. Assn.'s Convention.
Oct. 19-26.....Atlanta, Ga., American Road Congress of the American Highway Assn. and the A. A. A.
Oct. 28-31.....Milwaukee, Wis., Convention, Northwestern Road Congress, Auditorium.
Nov.....El Paso, Tex., Phoenix Road Race, El Paso Auto Club.
Nov. 8-9.....El Paso to Phoenix, Ariz., Automobile Race.
Nov. 8-11.....Shreveport, La., Track Meet, Shreveport Auto Club.
Dec. 1-4.....New York City, Annual Meeting of the American Society of Mechanical Engineers.
Jan. 2-9.....New York City, Annual Automobile Show, Grand Central Palace.
Jan. 3-10.....Buenos-Aires, Argentina, Grand Prize of Argentina.
Jan. 9-16.....Philadelphia Automobile Show.
Jan. 23-30.....Chicago, Ill., Automobile Show, First Regiment Armory.
Jan. 30-Feb. 6....Minneapolis, Minn., Show, National Guard Armory, Minneapolis Automobile Trade Assn.
Mar. 7.....San Francisco, Cal., Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 14.....San Francisco, Cal., Panama-Pacific Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Feb. 22.....San Francisco, Cal., Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

Recent Incorporations in the Automobile Field

AUTOMOBILES AND PARTS

Delaware

WILMINGTON—Postles Automobile Brokerage Co.; capital, $50,000; to transact a motor car brokerage business. Incorporators: G. P. Postles, L. A. Braidley and S. D. Townsend, Jr.

Illinois

CHICAGO—Eagle Cycle Car Co., under Massachusetts laws; capital, $250,000; to manufacture motor cars. Incorporators: J. Parker, U. B. Curtis and E. G. Lancaster.

CHICAGO—Modern Auto Parts Co.; capital, $20,000; to manufacture motor cars, parts, gasoline engines and parts thereof. Incorporators: E. S. Carr, W. R. Fetzer and E. A. Biggs.

Massachusetts

SPRINGFIELD—Hendee Mfg. Sales Co.; capital, $50,000; to sell motorcycles, motor cars, aeroplanes, etc. Incorporators: G. M. Hendee, Suffield, Conn.; F. J. Weschler, Springfield.

Michigan

DETROIT—McKenney-Devlin Co.; capital, $10,000; to manufacture and sell motor cars. Incorporators: George A. and Lyle A. Devlin and Paul R. McKenney.

DETROIT—Stoepel Co.; capital, $1,000; to deal in motor cars and supplies. Incorporators: H. Robert Stoepel, David M. Whitney and Nathan T. Viger.

New Jersey

CLIFTON—Lubricating Accessories Co.; capital, $25,000; to manufacture motor cars and lubricating specialties. Incorporators: J. Swanson, R. W. Haubner and P. A. Ott, all of Clifton.

New York

JAMESTOWN—Gabrielson Car Parts Mfg. Co.; capital, $35,000; to manufacture motor car parts, etc. Incorporators: John Gabrielson, Gustaf A. Lawson and Oscar A. Lenna, all of Jamestown.

ROCHESTER—J. Lawrence Hill Co.; capital, $10,000; general motor car business. Incorporators: J. Lawrence Hill, 40 Warwick avenue; James Jaffray, 45 Richard street; Joshua C. Harris, 327 Webster avenue.

NEW YORK—Saxon Motor Co. of New York; capital, $1,000. Incorporators: Harry W. Ward, 1305 Bellevue avenue; Lincoln R. Scafe, 173 Clairmont avenue; Laurence Moore, 473 Jefferson avenue; all of Detroit, Mich.

SYRACUSE—Reo Sales Co.; capital, $15,000; general motor car business. Incorporators: George E. Norris, 136½ Furman street; Harold N. DeWitt, Camden; Charles H. Norris, 28 James street.

Ohio

MASSILLON—Wagner Auto Garage Co.; capital, $10,000; to deal in motor cars and operate a garage. Incorporators: C. W. Wagner, F. M. Lore, G. A. Siebaneller, C. A. Wendling and C. M. James.

Pennsylvania

HARRISBURG—Cummins Motor Car Co.; capital, $25,000; to deal in motor cars and operate garages. Incorporators: O. O. Cummins, T. Y. Gregg and H. R. Walker.

PITTSBURGH—Motor Square Auto Dealers' Co.; capital, $5,000; to deal in motor cars. Incorporators: William H. La Fountain, Frank P. Blackmore, Lovell M. Johnson, C. P. Galanot and Frank Nichol, all of Pittsburgh.

GARAGES AND ACCESSORIES

Indiana

FRANKLIN—Parr Auto Shoe Co.; capital, $10,000; motor car supplies. Incorporators: W. A. Parr, G. E. Parr and William Feathergill.

GARY—Fifth Avenue Garage; capital, $5,000; general garage business. Incorporators: William Sykes, Ralph Sykes and Carlisle Dorman.

INDIANAPOLIS—Garage Owners' Association of Indiana; to improve conditions relating to public garages. Incorporators: W. N. Mitchell, A. L. Mitchell and George Pfieger.

INDIANAPOLIS—St. Clair Taxicab Co.; capital, $2,000; to conduct a motor vehicle business. Incorporators: B. G. Schwankhaus, Roger Kinney and C. B. Miles.

New Jersey

PATERSON—New Jersey Motorbus Co.; capital, $50,000; to operate motor buses, hacks, cabs, etc. Incorporators: L. Cramer, Sr., L. Cramer, Jr., and J. J. Purce, all of Paterson.

New York

LONG ISLAND CITY—Astoria Auto Trucking Co.; capital, $3,000. Incorporators: Philip Silliman, 192 Purdy street; Christopher Straub, East Elmhurst, L. I.; E. W. Ryder, 104 Taylor street, Brooklyn.

NEW YORK—Accident-Proof Tire Co.; capital, $250,000; to manufacture and deal in Cumberland tire filler and other motor car accessories. Incorporators: Kerr F. Albertson, 54 Morningside drive; James O. Hodge, 878 E. 23d street; Carl W. Stuart, Oriental Hotel; all of Brooklyn.

YONKERS—Frank X. Smith; capital, $1,000; to manufacture and deal in tires and rubber goods. Incorporators: Frank X. Smith, 312 New Main street; C. W. Reynolds, 188 Wadsworth avenue, New York city; Thomas F. MacMahon, 1400 Broadway, New York city.

Ohio

CLEVELAND—Ot-to No Air Tire Co.; capital, $100,000; general rubber manufactures. Incorporators: Frederick V. Roesel, Wallace B. Ott, George M. Ott, George N. Gilmore and Charles H. Frank.

ELYRIA—I. T. S. Rubber Co.; capital, $100,000; to manufacture all kinds of rubber goods. Incorporators: J. G. Tirrford, A. G. Smith, C. H. Ingwer, William C. Smith and C. H. Lewis.

Oregon

PORTLAND—Interurban Autocar Co.; capital, $10,000; to conduct a passenger and freight line. Incorporators: W. E., Henry M. and Helen M. Williamson.

CHANGE OF NAME AND CAPITAL

Michigan

DETROIT, Benham Mfg. Co., from $45,000 to $65,000.

Missouri

ST. LOUIS, George C. Brinkman Motor Car Co., from $5,000 to $50,000.

Ohio

AKRON, Marathon Tire & Rubber Co., from $100,000 to $500,000.

COLUMBUS, Twyman Motor Car Co., from $30,000 to $10,000.

Automobile Agencies Recently Established

PASSENGER CARS

California

San Francisco	Maxwell	The Pearson Motor Car Co.	

Florida

Miami	Herff-Brooks	Belcher Auto Co.	

Georgia

Atlanta	Dodge	The Pegram Motor Ca Co.	

Illinois

Chicago	Herff-Brooks	Chicago Great Western Motor Car Co.	
Clifton	Herff-Brooks	A. N. Grossaint	
Clinton	Herff-Brooks	Arthur Shaw	
Cropsey	Elk-Hart	John Popejoy	
Deer Plain	Cole	R. L. Meyer	
Jerseyville	Cole	Wm. Sheppard	
Peoria	Herff-Brooks	Zoller Bros.	
Springfield	Herff-Brooks	Baker & Baker	
Sublette	Elk-Hart	C. J. Streit	

Indiana

Vincennes	Cole	W. A. Miller	

Iowa

Oelwein	Cole	J. C. Knapp	
Shennandoah	Franklin	Franklin Car Co.	
Sioux City	Herff-Brooks	Adams Auto Co.	

Kansas

Fort Scott	Cole	Central Garage	
Garnett	Cole	J. J. Anderson & Son	
Manhattan	Cole	Hiner & Paige	
Paola	Cole	C. C. Hoover	
Yates Center	Cole	Stoll Bros.	

Kentucky

Barbourville	Ford	W. H. McDonald	
Louisville	Dodge	Southern Motors Co.	
Williamsburg	Ford	Geo. N. Delaney	

Louisiana

Blankston	Herff-Brooks	Hopewell Planting Co.	
New Orleans	Ford	O. C. Pantall	

Maryland

Crisfield	Elk-Hart	Crow Elk-Hart Motor Co.	

Massachusetts

Boston	Mitchell	Fred. H. Lucas	
Springfield	Winton	August Van der Wolk	
Worcester	Cole	Thorvald Hanson	
Worcester	Franklin	F. B. Williams	

Michigan

Detroit	Briscoe	The Kininger-McHugh Co., Inc.	
Detroit	King	The Monarch Hardware Co.	
Lansing	Briscoe	A. W. Brown & H. L. Brown	
Port Huron	Buick	George E. Yokum	

Minnesota

Albert Lea	Franklin	Hellie Auto Co.	
Duluth	Cole	Johnson Motor Car Co.	
Mankato	Cole	Laurie Marx	
Minneapolis	Oldsmobile	Bohn E. Fawkes	
Minneapolis	Elk-Hart	Alex. R. Curtis	
Princeton	Cole	S. P. Skahen	
Rochester	Cole	West & Postier	
St. Paul	Cole	Martin Motor Car Co.	
Starkville	Cole	D. O. Slaughter	

Mississippi

Starkville	Cole	D. O. Slaughter	

Missouri

Columbia	Cole	Columbia Auto Co.	
Drexel	Cole	C. H. Paulk	
Eldon	Cole	Ed. C. Weeks	
Kansas City	Allen	Jackson Motor Co.	
Kansas City	Briscoe	Bond Motor Co.	
Kansas City	Car Nation	Apple Motor Co.	
Kansas City	Chandler	E. C. Eads	
Kansas City	R. C. H.	Bruening Bros.	
Kansas City	Saxon	Bond Motor Co.	
Marshall	Cole	Blooser Bros.	
Poplar Bluff	Cole	J. A. Quinn	
St. Joseph	Studebaker	The Holliday Motor Car Co.	
Versailles	Cole	Crewson & Monsess	

Nebraska

Gering	Franklin	C. C. Hampton	
Omaha	Elk-Hart	Nebr. Crow-Elk-Hart Co.	

New York

Binghamton	Chandler	The Binghamton Motor Car Co.	
Ithaca	Franklin	F. A. McClune	
Little Falls	Cole	Nellis B. Bronner	
Oswego	Herff-Brooks	Ontario Motor Car Co.	
Utica	Buick	I. R. Gardinier	

North Carolina

Asheville	Cole	The Enterprise Machine Co.	
Raleigh	Elk-Hart	The Crow Motor Sales Co.	

Ohio

Akron	Cole	Summit Auto Co.	
Canal Dover	Chandler	The Dover Automobile Co.	
Cincinnati	Packard	The Citizens Motor Car Co.	
Cleveland	Dodge	Neighbors Motor Co.	
Cleveland	Herff-Brooks	Brandt Motor Car Co.	
Columbus	Buick	The Oscar Lear Motor Co.	
Columbus	Maxwell	The Everitt Auto Sales Co.	
Columbus	Oakland	Oscar Lear Motor Co.	
Columbus	Premier	Edward Miller	
Columbus	Allen	The Snyder Automobile Co.	
Columbus	Cole	The Brasher Motor Co	
Columbus	Krit	The Cummins Auto Sales Co.	
Columbus	Paige	Central Auto Veh. Co	
Columbus	Winton	E. J. Thornton	
Coshocton	Allen	W. E. Layman	
Coshocton	Oldsmobile	W. E. Layman	
Dayton	Cole	C. W. Hoffritz Sales Co	
Hillsboro	Ford	The Hillsboro Motor Co	
Kenton	Grant	W. S. Snyder	
Lima	Buick	The Independence Motor Co.	
Lima	Chalmers	W. E. Rudy	
Lima	Ford	Bertran & Friedley	
Lima	Hudson	Baxter Bros.	
Lima	Lewis	The Shappell Auto Sales Co.	
Lima	Maxwell	Wilbur Miller	
Lima	Partin-Palmer	The Shappell Auto Sales Co.	
Lima	Studebaker	E. H. Hawisher	
Lima	Cole	Thomas Motor Co.	
Louisville	Herff-Brooks	G. F. Munk	
Marion	Cole	Charles E. Miller	
New Concord	Elk-Hart	F. C. Noble	
Sandusky	Cole	W. C. Waterfield	
Sebring	Cole	Sebring Auto & Repai Co.	
Springfield	Cole	Ensign Motor Co.	
Stockdale	Elk-Hart	O. E. Emory & Co.	

Oklahoma

Tulsa	Cole	Chapple Bros.	

Pennsylvania

Allentown	Cole	V. H. Steckel	
Cressona	Herff-Brooks	I. A. Reber	
Easton	Cole	Lafayette Motor Car Co.	
Philadelphia	Herff-Brooks	Henry Hoopes	
Pulaski	Cole	John M. Reed	
Reading	Cole	The Park Auto Sales Co.	
Snyders	Herff-Brooks	D. H. Henninger	

ELK Terminal—John B. Stam & Co., 1789 Broadway, New York City, is making a spark plug terminal, Fig. 1, unique in construction. The terminal is attached to the electrode by simply snapping the jaws over it. No solder or special tools are used in fastening the terminal to the wire yet a solid joint is made. About 1-2-inch of the high-tension cable is bared and this is thrust into the end of the terminal, which consists of a hollow screw. When this is screwed up the wire is clamped solidly in place.

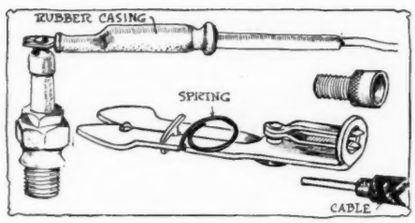

Fig. 1—Elk terminal. Right shows device assembled and at the left disassembled

Pneumatic Safety Clutch—Easy clutch engagement is automatically secured in the clutch, Fig. 2, manufactured by the Verges Mfg. Co., Fourth and Poplar streets, Milwaukee, Wis., by means of air displacement. It is a leather-faced, cone type which contains an air-chamber and a piston. When the clutch is released and the foot is removed from the pedal, the air resists the spring and will not permit the clutch to engage any faster than air is forced out of the chamber through the pet cock. The speed of engagement is regulated by the setting of this cock. Thus it is seen that it is impossible to make the clutch grab yet it is stated that the clutch engages rapidly enough for a quick start.

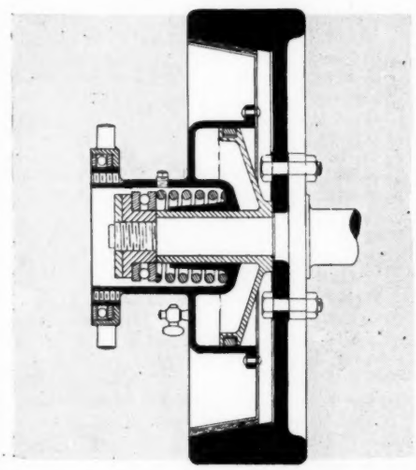

Fig. 2—Pneumatic safety clutch that cannot be made to grab

Clark Small Car Motor—A four-cylinder motor, Fig. 3, rated at 10-15 horsepower, and equipped with the motor, clutch and gearbox in unit, when desired, is manufactured by the Clark Engine & Boiler Co., Kalamazoo, Mich. The bore and stroke are 2.5 by 3.75 inches, giving a piston displacement of 74 cubic inches, which places the motor in the light car classification. The gearset is a two-speed and reverse sliding gear design.

The cylinders are cast in a block and are of the L-head type. The valves are fully inclosed and the push rods are adjustable. Access to the valves and piston heads is obtained by means of a detachable cylinder head. The valves are drop-forged, heat treated and ground to a close limit. Mushroom valve tappets, hardened and ground are employed and can be adjusted within .005 inch. The camshaft is a one-piece drop forging.

Two white metal bearings are used to support the crankshaft the one on the gear end being 1.625 by 2.5 inches, and on the flywheel end 1.625 by 3 inches. The crankpins are 1.625 by 1.875 inches. The gears are spirally cut to insure silence.

Ignition is supplied by a Schebler carbureter, and the Berling magneto is used. Constant-level splash lubrication has been adopted, the supply being maintained by a pump. All parts are hardened and ground and all bolts and studs are built according to the S. A. E. standard.

Sangamo Ampere Hour Meter.—The Sangamo Electric Co., Springfield, Ill., is manufacturing a variety of types of ampere hour meters to meet the many conditions imposed by electric vehicle service, but in every case the meter consists essentially of a small electric motor device having the moving system completely immersed and floated in mercury, but with the containing chamber built in such a way that the mercury cannot be spilled. The revolutions of the little motor are proportional to the amount of current, taken from the battery or put into it from moment to moment, so that by recording the revolutions through a suitable clockwork dial, the ampere hours taken out or put into the battery can be shown as simply as the time is recorded by a clock.

The operating parts of the meter are enclosed in several forms of case. The one principally used on electrics has a dial large enough for easy reading. It is equipped with an aluminum base. The type generally used for a commercial vehicle service has an iron base with very heavy bottom connecting terminals.

The most highly developed type of ampere hour meter is that having the distant dial combined with a Weston ammeter.

The ammeter is useful on an electric vehicle to show the amount of current drawn at any time, thus indicating the condition of the tires, brakes, bearings, etc., and combined with the ampere hour meter the ammeter is a very useful instrument. Of the two, however, this concern claims, an ampere hour meter is more valuable, because a person driving an electric vehicle knows at any moment how much current has been taken from the battery and therefore the amount still available. Also, when charging, the ampere hour meter is the only device which will automatically give the necessary amount of overcharge for any type of battery, it is stated.

Swan Demountable Ford Bodies—Demountable coupe and limousine bodies, by means of which a Ford car can be converted from an open car into a closed one in 30 minutes are manufactured by the Swan Demountable Body Co., 4021 Payne avenue, Cleveland, O.

This type of body is placed directly over the touring body, making a cold and weather-proof construction. It is stated that it cannot rattle or squeak. The price of the limousine is $150 and the coupe body $90.

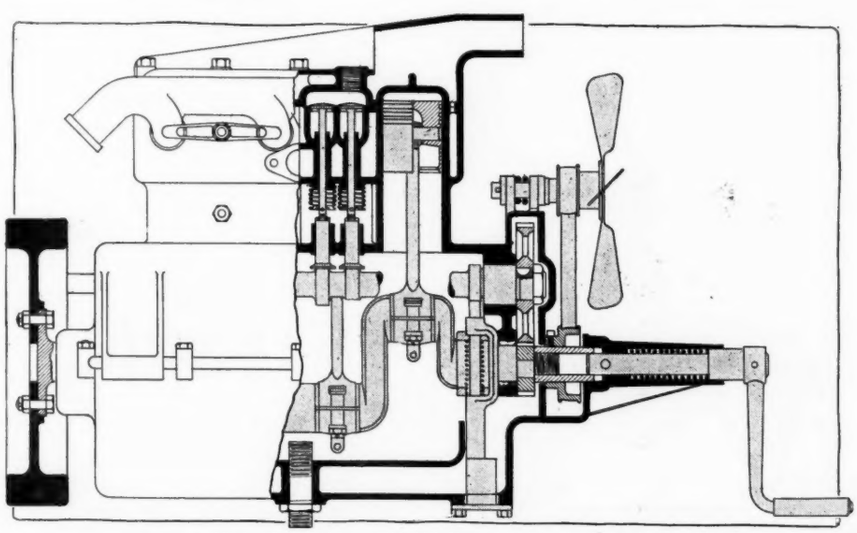

Fig. 3—Four-cylinder Clark motor of 10-15 horsepower. It can be equipped with clutch and gearset in unit when desired

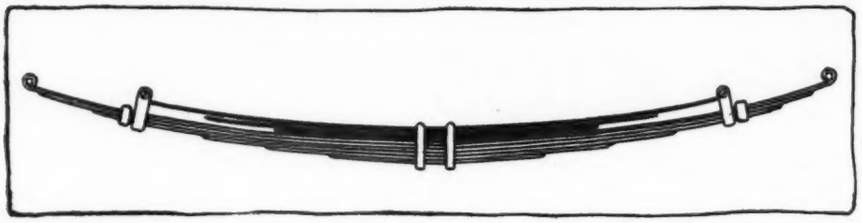

Fig. 4—Andersen auxiliary spring that is designed to carry light and heavy loads equally well

Andersen Auxiliary Spring—A spring system is shown in Fig. 4 which, it is claimed will carry the light and heavy load equally well, that will take the light and heavy shock alike, that has scarcely any recoil, that needs no shock absorbers, and that is nearly unbreakable. The Andersen system is built in two sections; the lower consists of a light spring to carry the empty car only. The top section consists of a series of leaves built on the individual leaf plan, that is, every leaf is connected at the center but gradually separates toward the ends. This section is shorter than the lower section. From the end of the top leaf of the top section is a shackle which passes under the lower section. When the weight of the empty car is on the lower section there is no tension on the leaves of the top section. As you place the load in the car the lower section picks up the shackle which is fastened to the top leaf of the top section and engages as many leaves as is needed according to the load placed in the car. By this system if a five-passenger car has one passenger in it you have a five-passenger car with a one-passenger spring suspension. It is manufactured by the Andersen Spring Co., Detroit, Minn.

La Porte Shock Absorber—Charles La Porte, formerly chief engineer of the Aristos Co., New York City, has brought out a shock absorber that is designed to remain passive during the normal spring play and active only when required. This is the ideal action for a spring controller or shock absorber.

Referring to Fig. 5 it will be seen that this device is of the conventional scissors or V form, consisting of an upper and lower arm pivoted at the center. The top arm is machined to receive an acme threaded screw, which screw is worked in and out by the lower arm driving it. The action takes place when the screw, being turned radially, when the car springs close or open, thereby causes a lateral action of the two arms. On the down stroke of the car, the shock absorber has no effect on the springs, as the screw and nut move outwards, but on the rebound or opening of the springs, the screw and nut move towards each other, causing the lower arm, which slides on the screw, to move out against the rubber washer, which is held firmly by the outside nut, the amount of compression of this rubber deciding the resistance offered.

It can readily be seen that the slotted adjusting nut can set the pressure on the rubber washer to any amount desired. This feature permits any amount of normal spring action before bringing the device into its controlling action. This adjustment is made when applying on the car and need never be changed again, it is stated.

Buckeye De Luxe Shock Absorbers—For Ford cars only, the Buckeye De Luxe shock absorbers, Fig. 6, are of the well-known helical spring variety, but with the feature that perfect alignment with the car springs is obtained at all times by means of the knife-edge support of the spring seat. The spring seat is made of bronze. Two springs are used in each unit. The eye bolts are bushed. There are no holes to drill, and it is stated that anyone can attach them in an hour. A set of four is $15, and two, for either front or rear, are $8. The manufacturer is the Central Brass and Fixture Co., Springfield, O.

Universal Reel Light—A dash or gauge light and trouble lamp combined, which may be operated from any convenient source of current, is the Universal Reel Light, Fig. 7. Ordinarily it is used as a dash light, but when a trouble lamp is wanted, it may be detached from its case on the dash and the cord inside the case unreeled to any length up to 12 feet. When the cord is to be returned, it is wound up by means of a small handle on the front of the device.

By means of a ball and socket joint, the stem or handle which holds the light can be turned in any direction and may be fastened in any position by means of a small thumb nut. The reflector is also

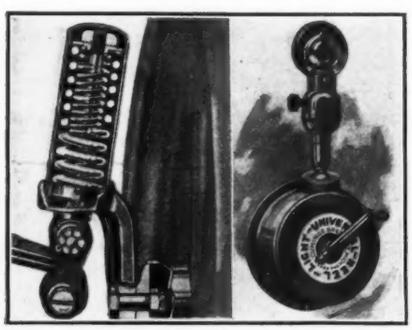

Fig. 6—Left—Buckeye DeLuxe shock absorbers for Ford cars only

Fig. 7—Right—Universal Reel Light which is a dash and trouble lamp combined

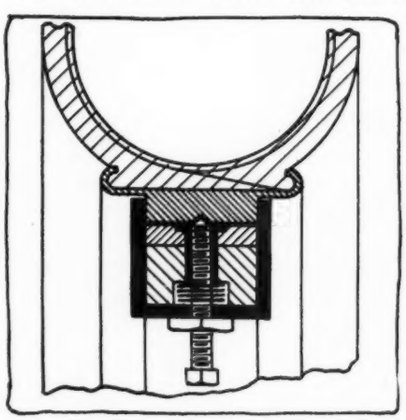

Fig. 8—Simplex demountable rim

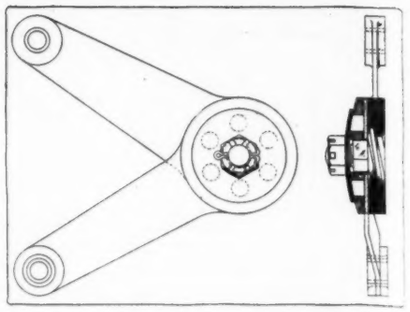

Fig. 5—La Porte shock absorber

adjustable. It is made by Cummings Bros., Flint, Mich., and sells for $4.

Simplex Demountable Rim—Lightness is the particular feature claimed for the rim shown in Fig. 8. It will be noted that the rim is removed by backing up the bolts pinning it in place. Furthermore as there are no parts to be removed there are none to be lost on the road. No special tools are required, a monkey wrench being sufficient. It is stated that any type of demountable rim can be changed over into this type with little difficulty and small expense. The device is manufactured by the Simplex Demountable Rim Co., Milwaukee, Wis.

Krick Friction Transmission—The feature of the friction speed change, Fig. 9, manufactured by the Krick Co., East Fifty-fifth street and Dorchester avenue, Chicago, Ill., is the direct drive on high.

All the working parts are mounted on a steel frame which is attached to the vehicle frame by a three-point suspension, or rigid if desired, and the connection is made to the engine and the rear axle in the usual way.

The two friction wheels bear equally against the driving disc and on each side of the driving shaft. This does away with the side cramp which cannot be avoided with the single friction transmission and this with about one-half the applied pressure to the driving disc.

The two friction wheels slide on square shafts, with no keys to work loose or quickly wear out. All of the rotating parts are mounted on double row ball bearings of the self-aligning type. A special selected chrome nickel steel is used. The list price is $65.

Bryant Gearshift Lock—Due to a typographical error the price of the Bryant Gearshift lock made by the Bryant Sales Co., 422 Cuyahoga Building, Cleveland, O., was stated as $3, when $8 is the price, in the description which appeared in the August 20 issue on page 388.

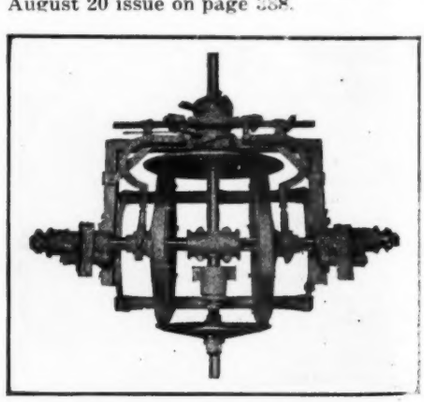

Fig. 9—Krick friction transmission